Matematičke i informacione tehnologije
Математические и информационные технологии
Mathematical and Informational Technologies

MIT 2009

August, 27 - 31, 2009, Kopaonik, Serbia
August, 31 - September, 5, 2009, Budva, Montenegro

Vodič konferencije

Справочник конференции

Conference Information

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Conference Information

Organizatori konferencije:

- Institut računarskih tehnologija SO RAN, Novosibirsk, Rusija
- Univerzitet u Prištini, Prirodno-matematički fakultet, Kosovska Mitrovica, Srbija
- Novosibirski državni tehnički univerzitetet, Novosibirsk, Rusija
- Kazahstanski nacionalni univerzitet "Al Farabi", Alma Ata, Kazahstan

Организаторы конференции:

- Институт вычислительных технологий СО РАН, Новосибирск, Россия
- Приштинский университет, Естественно-математический факультет, Косовска Митровица, Сербия
- Новосибирский государственный технический университет, Новосибирск, Россия
- Казахский национальный университет им. аль-Фараби, Алматы, Казахстан

The conference is organized by

- Institute of Computational Technologies, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia
- University of Pristina, Kosovska Mitrovica, Serbia
- Novosibirsk State Technical University, Novosibirsk, Russia
- Al-Farabi Kazakh National University, Almaty, Kazakhstan

Pokrovitelji konferencije:
- Ministarstvo za nauku i tehnološki razvoj Republike Srbije
- Prirodno-matematički fakultet, Kosovska Mitrovica
- Državni Univerzitet u Novom Pazaru
- Univerzitet u Prištini, Kosovska Mitrovica
- Medicinski fakultet, Kosovska Mitrovica
- Prof. dr Hranislav Milošević

Конференция проводится при поддержке:
- Министерства науки и технологического развития Республики Сербия
- Естественно-математического факультета университета Приштины, Косовска Митровица, Сербия
- Государственного университета в Нови Пазаре, Сербия
- Университета Приштины, Косовска Митровица, Сербия
- Медицинский факультет , Косовска Митровица, Сербия
- Профессора Хранислава Милошевича

The Conference is supported by the:
- Ministry of Science and Technological Development of the Republic of Serbia
- Natural-mathematical department, University of Pristina, Kosovska Mitrovica, Serbia
- Novi Pazar State University
- University of Pristina, Kosovska Mitrovica, Serbia
- School of Medicine, Kosovska Mitrovica, Serbia
- Prof. Dr. Hranislav Milosevic

Teme Konferencije:

Računarske tehnologije:
Računski metodi i računarski algoritmi za modelovanje složenih fizičkih pojava, organizacija paralelnog i distribuiranog računanrstva, teorija paralelnih procesa.

Informacione i telekomunikacione tehnologije:
Integracija distribuiranih informacionih resursa, obrada prostorno-raspoređenih podataka, tematski i programski orjentisani informacioni sistemi za geografske podatke i znanja, nove telekomunikacione tehnologije.

Matematičke tehnologije:
Diferencijalne jednačine u prirodnim naukama i tehnici, kompleksna analiza, osnovni i primenjeni zadaci matematičke statistike i terije verovatnoće.

Направления работы:

Вычислительные технологии:
Численные методы и вычислительные алгоритмы для моделирования сложных физических явлений; организация параллельных и распределенных вычислений, теория параллельных процессов.

Информационные и телекоммуникационные технологии:
Интеграция распределенных информационных ресурсов, обработка пространственно-распределенных данных; проблемно-ориентированные и предметно-ориентированные базы географических данных и знаний; новые телекоммуникационные технологии.

Математические технологии:
Дифференциальные уравнения в задачах естествознания и техники, комплексный анализ; фундаментальные и прикладные задачи математической статистики и теория вероятности.

Conference Topics:

Computing technologies:
Numerical methods and computational algorithms for modelling of the complex physical phenomena, parallel and distributed calculations, theory of parallel processes.

Information and telecommunication technologies:
Integration of distributed information resources, processing of spatially distributed data; problem-oriented and subject-oriented information systems for geographical data and knowledge; new telecommunicational technologies.

Mathematical technologies:
Differential equations in problems of natural sciences and engineering; complex analysis; fundamental and applied problems of mathematical statistics and probability theory.

Programski odbor:

Šokin J. I., akademik, Rusija, predsednik

Doličanin Ć., rektor državnog Univerziteta u N. Pazaru, Srbija, kopredsednik

Žumagulov B. T., akademik, Kazahstan, kopredsednik

Jovanović A., prorektor Univerziteta u Prištini, Srbija, kopredsednik

Kosanović K., dekan PMF Univerziteta u Prištini, Srbija, kopredsednik

Milošević H., profesor, Srbija, predsednik Organizacionog odbora

Petković D., profesor, Srbija, naučni sekretar

Čubarov L. B., profesor, Rusija, naučni sekretar

Banjanin M., profesor, Bosna i Hercegovina

Vuković M., profesor, Bosna i Hercegovina

Govedarica V., profesor, Bosna i Hercegovina

Pikula M., profesor, Bosna i Hercegovina

Krener D., profesor, Nemačka

Rozner K., profesor, Nemačka

Reš M., profesor, Nemačka

Šokina N., doktor, Nemačka

Kit E., profesor, Izrael

Sladkević M., doktor, Izrael

Danaev N. T., profesor, Kazahstan

Mansurov Z. A., profesor, Kazahstan

Orunhanov M. K., profesor, Kazahstan

Temirbekov N. M., profesor, Kazahstan

Žajnakov A. Ž., profesor, Kirgistan

Dimitrovski D., profesor, Makedonija

Bičkov I. V., član RAN, Rusija

Jerohin G. N., profesor, Rusija

Moskvićev V. V., profesor, Rusija

Potapov V. P., profesor, Rusija

Ričkov A. D., profesor, Rusija

Smagin S. I., član RAN, Rusija

Stempkovskij A. L., akademik, Rusija

Fedotov A. M., član RAN, Rusija

Horoševskij V. G., član RAN, Rusija

Šajdurov V. V., član RAN, Rusija

Banković B., profesor, Srbija

Gajić L., profesor, Srbija

Doroslovački R., profesor, Srbija

Žorić A., profesor, Srbija

Mijailović Ž., profesor, Srbija

Milovanović G., akademik, Srbija

Milovanović I., profesor, Srbija

Mijailović B., profesor, Srbija

Petrović M., profesor, Srbija

Pilipović S., akademik, Srbija

Protić E., profesor, Srbija

Radenković S., profesor, Srbija

Rakočević V., profesor, Srbija

Rajović M., profesor, Srbija

Cakić N., profesor, Srbija

Kanantaj A., profesor, Tajland

Tahir Beriri Mohamed, profesor, Tunis

Juldašev Z. H., profesor, Uzbekistan

Pavićević Ž., profesor, Crna Gora

Ejnarson B., profesor, Švedska

Radenković B., profesor, Srbija

Samodurov A. A., profesor, Belorusija
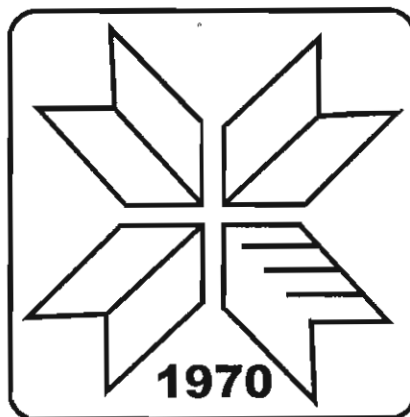
Программный комитет:

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Тахар Берири Мохамед, профессор, Тунис

Юлдашев З.Х., профессор, Узбекистан

Павичевич Ж., профессор, Черногория

Эйнарссон Б., профессор, Швеция
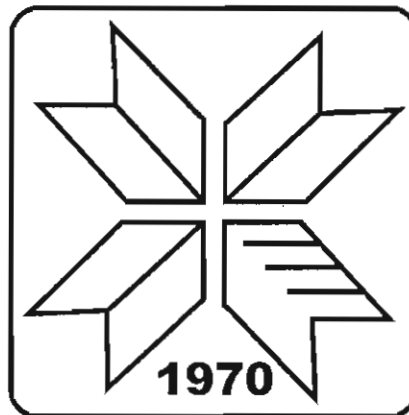
Programm Committee:

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Zhumagulov B.T., Academician, Kazakhstan, Co-chairman

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Kosanovic K., Professor, Serbia, Co-chairman

Milosevic H. , Professor, Serbia, Chairman of Organizing Committee

Petkovic D., Professor, Serbia, Scientific Secretary

Chubarov L.B., Professor, Russia, Scientific Secretary

Samodurov A.A., Professor, Belarus

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Vukovic M., Professor, Bosnia and Herzegovina

Govedarica V., Professor, Bosnia and Herzegovina

Pikula M., Professor, Bosnia and Herzegovina

Kroener D., Professor, Germany

Resch M., Professor, Germany

Roesner K., Professor, Germany

Shokina N.Yu., Doctor, Germany

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Sladkevich M.S., Doctor, Israel

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Mansurov Z.A., Professor, Kazakhstan

Orunkhanov M.K., Professor, Kazakhstan

Temirbekov N.M., Professor, Kazakhstan

Zhainakov A.Zh., Professor, Kyrgyzstan

Dimitrovski D., Professor, Macedonia

Pavicevic Z., Professor, Montenegro

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Erokhin G.N., Professor, Russia

Fedotov A.M., Corresponding Member of RAS, Russia

Khoroshevskii V.G., Corresponding Member of RAS, Russia

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Smagin S.I., Corresponding Member of RAS, Russia

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Gaic L., Professor, Serbia

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Mijailovic Z., Professor, Serbia

Milovanovic G., Academician, Serbia

Milovanovic I., Professor, Serbia

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Protic J., Professor, Serbia

Radenkovic B., Professor, Serbia

Radenovic S., Professor, Serbia

Rajevic M., Professor, Serbia
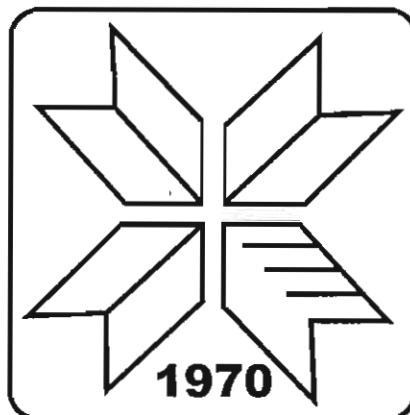
Rakocevic V., Professor, Serbia

Zoric A., Professor, Serbia

Einarsson B., Professor, Sweden

Kanantai A., Professor, Thailand

Tahar Berriri Mohamed, Professor, Tunis

Yuldashev Z.Kh., Professor, Uzbekistan

Plan rada konferencije MIT 2009 - Kopaonik

Četvrtak, 27.08.2009.	14:00 - 22:00	Dolazak i registracija učesnika
Petak, 28.08.2009.	08:00	Registracija učesnika
	09:00	Otvaranje konferencije
	09:30	Plenarna sednica
	11:00	Prijem kod Dekana - koktel
	11:30	Plenarna sednica
	13:30	Ručak
	14:30	Rad po sekcijama
	16:30	Kafe pauza
	16:45	Rad po sekcijama
	18:30	Okrugli sto „Matematika i informatika, savremeni tokovi"
	20:30	Večera
Subota, 29.08.2009.	09:00	Plenarna sednica
	11:00	Kafe pauza
	11:15	Plenarna sednica
	13:30	Ručak
	14:30	Rad po sekcijama
	16:30	Kafe pauza
	16:45	Rad po sekcijama
	18:30	Završetak rada po sekcijama
	20:30	Svečana večera - banket (restoran hotela Grand)
nedelja, 30.08.2009.	09:00	Plenarna sednica
	11:00	Kafe pauza
	11:15	Završna plenarna sednica
	13:30	Ručak
	15:00	Izlet žičarom na Pančićev vrh
	20:30	Večera
ponedeljak, 31.08.2009.	09:00	Odlazak učesnika kući
	09:00	Deo učesnika Konferencije, koji nastavljaju sa radom u Budvi, putuje uz obilazak manastira Gradac i Sopoćani.

Plan rada konferencije MIT 2009 - Budva

Utorak,	09:00	Prezentacija postera T1
01.09.2009.	13:30	Ručak
	14:30	Zasedanje radne grupe W2
	16:30	Kafe pauza
	16:45	Zasedanje radne grupe W2
	19:00	Završetak rada
Sreda,	09:00	Prezentacija postera T2
02.09.2009.	13:30	Ručak
	14:30	Zasedanje radne grupe W3
	16:30	Kafe pauza
	16:45	Zasedanje radne grupe W3
	19:00	Završetak rada
Četvrtak,	09:00	Prezentacija postera T3
03.09.2009.	13:30	Ručak
	14:30	Zasedanje radne grupe W4
	16:30	Kafe pauza
	16:45	Zasedanje radne grupe W4
	19:00	Završetak rada
Petak,	09:00	Zasedanje radne grupe W5
04.09.2009.	11:30	Zatvaranje konferencije
	13:30	Ručak
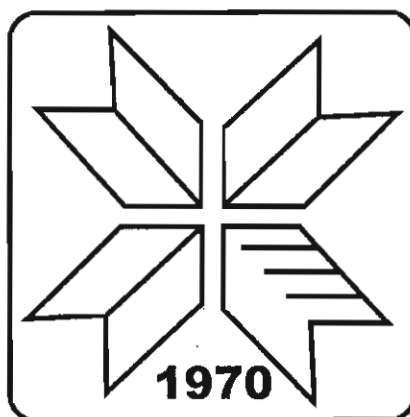
Расписание работы конференции МИТ 2009- Копаоник

Четверг, 27.08.2009.	14:00 - 22:00	Приезд и регистрация участников
Пятница, 28.08.2009.	08:00	Регистрация участников
	09:00	Открытие конференции
	09:30	Пленарное заседание
	11:00	Перерыв (прием у декана)
	11:30	Пленарное заседание
	13:30	Обед
	14:30	Секционные заседания
	16:30	Перерыв
	16:45	Секционные заседания
	18:30	Круглый стол «Математика и информатика, современные проблемы»
	20:30	Ужин
Суббота, 29.08.2009.	09:00	Пленарное заседание
	11:00	Перерыв
	11:15	Пленарное заседание
	13:30	Обед
	14:30	Секционные заседания
	16:30	Перерыв
	16:45	Секционные заседания
	18:30	Окончание работы
	20:30	Торжественный ужин – банкет (ресторан гостиницы Гранд)
Воскресенье, 30.08.2009.	09:00	Пленарное заседание
	11:00	Перерыв
	11:15	Завершающее пленарное заседание
	13:30	Обед
	15:00	Подъем на фуникулере к вершине «Панчичев Врх»
	20:30	Ужин
Понедельник, 31.08.2009.	09:00	Отъезд участников, завершивших работу на конференции
	09:00	Отъезд участников, продолжающих работу в Будве, с посещением по дороге монастырей Градац и Сопочаны.

Расписание работы конференции МИТ- Будва

Вторник,	09:00	Стендовые доклады T1
01.09.2009.	13:30	Обед
	14:30	Заседание рабочей группы W2
	16:30	Перерыв
	16:45	Заседание рабочей группы W2
	19:00	Окончание работы
Среда,	09:00	Стендовые доклады T2
02.09.2009.	13:30	Обед
	14:30	Заседание рабочей группы W3
	16:30	Перерыв
	16:45	Заседание рабочей группы W3
	19:00	Окончание работы
Четверг,	09:00	Стендовые доклады T3
03.09.2009.	13:30	Обед
	14:30	Заседание рабочей группы W4
	16:30	Перерыв
	16:45	Заседание рабочей группы W4
	19:00	Окончание работы
Пятница,	09:00	Заседание рабочей группы W5
04.09.2009.	11:30	Закрытие конференции
	13:30	Обед
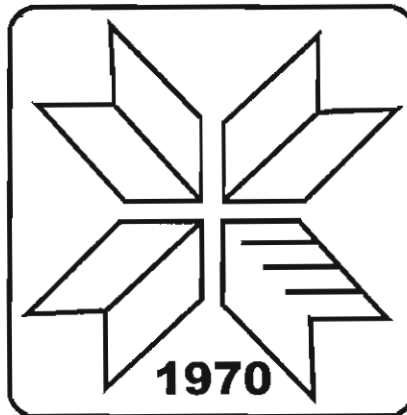
MIT 2009 Timetable - Kopaonik

Thursday, 27.08.2009.	14:00 - 22:00	Arrival and registration of participants
Friday, 28.08.2009.	08:00	Registration of participants
	09:00	Conference opening
	09:30	Plenary session
	11:00	Welcome reception - coctail
	11:30	Plenary session
	13:30	Lunch
	14:30	Workshops
	16:30	Coffee break
	16:45	Workshops
	18:30	Round table „Mathematical and Information Sciences, contemporary tendencies "
	20:30	Dinner
Saturday, 29.08.2009.	09:00	Plenary session
	11:00	Coffee break
	11:15	Plenary session
	13:30	Lunch
	14:30	Workshops
	16:30	Coffee Break
	16:45	Workshops
	18:30	End of day
	20:30	Banquet (restaurant of hotel Grand))
Sunday, 30.08.2009.	09:00	Plenary session
	11:00	Coffee Break
	11:15	Closing plenary session
	13:30	Lunch
	15:00	Tour to the Pancic's Peak
	20:30	Dinner
Monday, 31.08.2009.	09:00	Departure
	09:00	Participants continue Conferernce are travelling to Budva, Montenegro, and they will visit monasteries Gradac and Sopocani on their way.

MIT 2009 Timetable - Budva

Tuesday,	09:00	Poster session T1
01.09.2009.	13:30	Lunch
	14:30	Working group W2
	16:30	Coffee break
	16:45	Working group W2
	19:00	End of day
Wednesday,	09:00	Poster session T2
02.09.2009.	13:30	Lunch
	14:30	Working group W3
	16:30	Coffee break
	16:45	Working group W3
	19:00	End of day
Thursday,	09:00	Poster session T3
03.09.2009.	13:30	Lunch
	14:30	Working group W4
	16:30	Coffee break
	16:45	Working group W4
	19:00	End of day
Friday,	09:00	Working group W5
04.09.2009.	11:30	Conference closing
	13:30	Lunch

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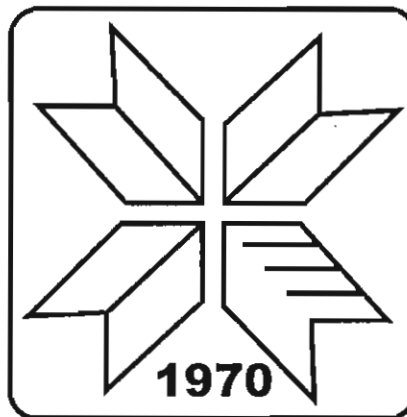
RADNE GRUPE

W1 – Radna grupa (okrugli sto)
"Matematika i informatika, savremeni tokovi"
Profesor Jurij Jakovlevič Belov
Profesor Dojčin Petković
Profesor Miloje Rajović
Profesor Vladica Stojanović
Profesor Stana Cvejić
Profesor Vladimir Viktorovič Šajdurov

W2 – Radna grupa (okrugli sto)
"Problemi savremenog matematičkog obrazovanja"
Profesor Jurij Ivanovič Šokin
Profesor Jurij Jakovlevič Belov
Profesor Hranislav Milošević
Profesor Mihail Petrovič Fedoruk
Profesor Vladimir Viktorovič Šajdurov

W3 – Radna grupa (okrugli sto) "Matematičko modeliranje"
Profesor Vladimir Viktorovič Šajdurov
Profesor Sergej Kuzmič Goluško
Profesor Eliezer Kit
Profesor Hranislav Milošević
Profesor Vladimir Viktorovič Moskvićev
Profesor Aleksandar Dimitrijevič Ričkov
Profesor Mihail Petrovič Fedoruk

W4 – Radna grupa (okrugli sto)
"Informacione tehnologije"
Profesor Jurij Ivanovič Šokin
Profesor Konstantin Jevgenjevič Afanasjev
Profesor Igor Vjačeslavovič Bičkov
Profesor Dojčin Petković
Profesor Vadim Petrovič Potapov
Profesor Anatolij Mihajlovič Fedotov

W5 – Radna grupa (okrugli sto)
"Sistemi monitoringa životne sredine"
Profesor Jurij Ivanovič Šokin
Profesor Igor Vjačeslavovič Bičkov
Doktor Nikolaj Nikolajevič Dobrecov
Profesor Vadim Petrovič Potapov
Profesor Dragan Radovanović
Profesor Leonid Borisovič Čubarov

РАБОЧИЕ ГРУППЫ

W1 – Рабочая группа (круглый стол)
«Математика и информатика; современные проблемы»
Профессор Юрий Яковлевич Белов

Профессор Дойчин Петкович

Профессор Милое Раевич

Профессор Владица Стоянович

Профессор Стана Цвейич

Профессор Владимир Викторович Шайдуров

W2 – Рабочая группа (круглый стол)
«Проблемы современного математического образования»
Профессор Юрий Иванович Шокин

Профессор Юрий Яковлевич Белов

Профессор Хранислав Милошевич

Профессор Михаил Петрович Федорук

Профессор Владимир Викторович Шайдуров

W3 – Рабочая группа (круглый стол) «Математическое моделирование»
Профессор Владимир Викторович Шайдуров

Профессор Сергей Кузьмич Голушко

Профессор Элиезер Кит

Профессор Хранислав Милошевич

Профессор Владимир Викторович Москвичев

Профессор Александр Дмитриевич Рычков

Профессор Михаил Петрович Федорук

W4 – Рабочая группа (круглый стол)
«Информационные технологии»
Профессор Юрий Иванович Шокин

Профессор Константин Евгеньевич Афанасьев

Профессор Игорь Вячеславович Бычков

Профессор Дойчин Петкович

Профессор Вадим Петрович Потапов

Профессор Анатолий Михайлович Федотов

W5 – Рабочая группа (круглый стол)
«Системы мониторинга окружающей среды»
Профессор Юрий Иванович Шокин

Профессор Игорь Вячеславович Бычков

Доктор Николай Николаевич Добрецов

Профессор Вадим Петрович Потапов

Профессор Драган Радованович

Профессор Леонид Борисович Чубаров

WORKING GROUPS

W1 – Work group (round table)
"Mathematical and Information Sciences, contemporary tendencies"
Professor Yurij Yakovlevich Belov
Professor Dojcin Petkovic
Professor Miloje Rajovic
Professor Vladica Stojanovic
Professor Stana Cvejic
Professor Vladimir Victorovich Shaidurov

W2 – Work group (round table)
"The problems of contemporary mathematical education"
Professor Yuri Ivanovitch Shokin
Professor Yurij Yakovlevich Belov
Professor Hranislav Milosevic
Professor Michail Petrovich Fedoruk
Professor Vladimir Victorovich Shaidurov

W3 – Work group (round table) "Mathematical modeling"
Professor Vladimir Victorovich Shaidurov
Professor Sergey Kuzmich Golushko
Professor Eliezer Kit
Professor Hranislav Milosevic
Professor Vladimir Victorovich Moskvichev
Professor Alexander Dmitrievich Rychkov
Professor Michail Petrovich Fedoruk

W4 – Work group (round table)
"Information Technology"
Professor Yuri Ivanovitch Shokin
Professor Konstantin Evgenievich Afanasiev
Professor Igor Vyacheslavovich Bychkov
Professor Dojcin Petkovic
Professor Vadim Petrovich Potapov
Professor Anatoilii Michailovich Fedotov

W5 – Work group (round table)
"Environmental monitoring systems "
Professor Yuri Ivanovitch Shokin
Professor Igor Vyacheslavovich Bychkov
Doctor Nikolay Nikolayevich Dobretsov
Professor Vadim Petrovich Potapov
Professor Dragan Radovanovic
Professor Leonid Borisovich Chubarov

Dan	1	2	3	4	5	6	7	8	9	10
Dan	27 avgust (četvrtak)	28 avgust (petak)	29 avgust (subota)	30 avgust (nedelja)	31 avgust (ponedeljak)	1 septembar (utorak)	2 septembar (sreda)	3 septembar (četvrtak)	4 septembar (petak)	5 septembar (subota)
	Kopaonik, Srbija					*Budva, Crna Gora*				
Vreme										
08:00	Dolazak na Kopaonik	Registracija	Plenarna sednica P3	Plenarna sednica P5	Odlazak sa Kopaonika	Dolazak u Budvu				Odlazak iz Budve
09:00	Registracije na Kopaoniku	Otvaranje								
09:30		Plenarna sednica P1			Obilazak manastira Gradac i Sopoćani	Prezentacija radova T1	Prezentacija radova T2	Prezentacija radova T3	Zasedanje radne grupe W5	
11:00		Prijem kod Dekana	Kafe pauza							
11:15										
11:30		Plenarna sednica P2	Plenarna sednica P4	Plenarna sednica P6	Dolazak u Budvu	Zasedanje radne grupe W2	Zasedanje radne grupe W3	Zasedanje radne grupe W4	Zatvaranje konferencije	
13:30		Sekcija S1	Sekcija S1			Zasedanje radne grupe W2	Zasedanje radne grupe W3	Zasedanje radne grupe W4		
14:30		Sekcija S2 / Sekcija S2	Sekcija S1 / Sekcija S1			Ručak	Ručak	Ručak		
16:30		Sekcija S3 / Sekcija S4	Sekcija S2 / Sekcija S2			Kafe pauza	Kafe pauza			
16:45		Zasedanje radne grupe W1	Sekcija S5 / Sekcija S5			Završetak rada	Završetak rada	Završetak rada	Završetak rada	
18:30			Završetak rada po sekcijama							
19:00		Večera	Svečana večera (banket)	Večera		Večera	Izlet žičarom na Pančićev vrh	Večera		
20:30										

Колаоник, Сербия — **Будва, Черногория**

день	1	2	3	4	5	6	7	8	9	10
дата	27 августа (четверг)	28 августа (пятница)	29 августа (суббота)	30 августа (воскресенье)	31 августа (понедельник)	1 сентября (вторник)	2 сентября (среда)	3 сентября (четверг)	4 сентября (пятница)	5 сентября (суббота)
время										
8-00	Регистрация в Колаонике	Регистрация								Отъезд из Будвы
9-00		Открытие			Отъезд из Колаоника					
9-30	Заезд в Колаоник	Пленарное заседание Р1	Пленарное заседание Р3	Пленарное заседание Р5	Экскурсия в монастыри Градац и Сопочаны	Стендовые доклады Т1	Стендовые доклады Т2	Стендовые доклады Т3	Заседание рабочей группы W5	
11-00		Прием у декана								
11-15			Перерыв	Перерыв						
11-30		Пленарное заседание Р2	Пленарное заседание Р4	Пленарное заседание Р6	Переезд в г. Будву				Закрытие конференции	
13-30		Обед	Обед			Обед	Обед	Обед		
14-30		Секция S1, Секция S2, Секция S3 / Секция S1, Секция S2, Секция S4	Секция S1, Секция S2, Секция S3 / Секция S1, Секция S2, Секция S5	Подъем на фуникулере к вершине «Планинче Врх»		Заседание рабочей группы W2	Заседание рабочей группы W3	Заседание рабочей группы W4		
16-30		Перерыв	Перерыв			Перерыв	Перерыв	Перерыв		
16-45		Секция S1, Секция S2, Секция S3 / Секция S1, Секция S2, Секция S4	Секция S1, Секция S2, Секция S3 / Секция S1, Секция S2, Секция S5			Заседание рабочей группы W2	Заседание рабочей группы W3	Заседание рабочей группы W4		
18-30		Заседание рабочей группы W1	Окончание работы			Окончание работы	Окончание работы	Окончание работы	Окончание работы	
19-00		Ужин	Торжественный ужин	Ужин						
20-30										

			Kopaonik, Serbia				Budva, Montenegro				
Day		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Day		27 August (Thursday)	28 August (Friday)	29 August (Saturday)	30 August (Sunday)	31 August (Monday)	1 September (Tuesday)	2 September (Wednesday)	3 September (Thursday)	4 September (Friday)	5 September (Saturday)
Time											
08:00		Arrival of participants	Registration			Departure					Departure
09:00			Conference opening								
09:30			Plenary session P1	Plenary session P3	Plenary session P5	Visit monasteries Gradac and Sopoćani	Poster session T1	Poster session T2	Poster session T3	Working group W5	
11:00			Welcome reception	Coffee break	Coffee break						
11:15											
11:30		Registration of participants	Plenary session P2	Plenary session P4	Plenary session P6	Arriving Budva	Working group W2	Working group M3	Working group W4	Conference closing	
13:30			Lunch	Lunch	Tour to the Pančić's Peak		Lunch	Lunch	Lunch		
14:30			Workshop S1 / Workshop S1; Workshop S2 / Workshop S2; Workshop S3 / Workshop S4	Workshop S1 / Workshop S1; Workshop S2 / Workshop S2; Workshop S5 / Workshop S5			Working group W2	Working group W3	Working group W4		
16:30			Coffee break	Coffee break			Coffee break	Coffee break	Coffee break		
16:45			Working group W1	Ending workshops work			Ending work	Ending work	Ending work		
18:30			Dinner	Banquet	Dinner						
19:00											
20:30											

Raspored aktivnosti po objektima

1. Registracija učesnika smeštenih u objektima "Sunčani vrhovi" na recepciji hotela "Sunčani vrhovi",
   - četvrtak 27.08.2009. od 14:00 do 22:00 sata
   - petak, 28.08.2009. od 08:00 do 12:00 sati
2. Registracija učesnika smeštenih u hotelu "Grand" na recepciji hotela "Grand", -četvrtak 27.08.2009. od 14:00 do 22:00 sata
3. Ceremonija otvaranja - sala "Holidej", hotel "Sunčani vrhovi"
4. Sva plenarna zasedanja - sala "Holidej", hotel "Sunčani vrhovi"
5. Zasedanje sekcije S1 - sala "Holidej", hotel "Sunčani vrhovi"
6. Zasedanje sekcije S2 - sala "Malo jezero", hotel "Sunčani vrhovi"
7. Zasedanje sekcije S3 - sala "Prezident", hotel "Sunčani vrhovi"
8. Zasedanje sekcije S4 - sala "Prezident", hotel "Sunčani vrhovi"
9. Zasedanje sekcije S5 - sala "Prezident", hotel "Sunčani vrhovi"
10. Zasedanje Radne grupe W1 - sala "Prezident", hotel "Sunčani vrhovi"

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Места проведения мероприятий Конференции

1. Регистрация участников, проживающих в гостинице "Сунчани Врхови" – холл гостиницы "Сунчани Врхови",
   - четверг 27.08.2009: с 14:00 до 22:00,
   - пятница, 28.08.2009: с 08:00 до 12:00.
2. Регистрация участников, проживающих в гостинице "Гранд" – холл гостиницы "Гранд"
   - четверг 27.08.2009. С 14:00 до 22:00,
3. Церемония открытия - зал "Холидей" гостиницы "Сунчани Врхови"
4. Все пленарные заседания - зал "Холидей" гостиницы "Сунчани Врхови"
5. Заседание секции S1 - зал "Холидей" гостиницы "Сунчани Врхови"
6. Заседание секции S2 - зал "Мало езеро" гостиницы "Сунчани Врхови"
7. Заседание секции S3 - зал "Президент" гостиницы "Сунчани Врхови"
8. Заседание секции S4 - зал "Президент" гостиницы "Сунчани Врхови"
9. Заседание секции S5 - зал "Президент" гостиницы "Сунчани Врхови"
10. Заседание Круглого стола W1 - зал "Президент" гостиницы "Сунчани Врхови"

Venues

1. Registration of participants, who are living in the hotel "Suncani vrhovi",
   at the lobby of the hotel "Suncani vrhovi",
   - Thursday 27.08.2009: since 02:00 PM till 10:00 PM
   - Friday 28.08.2009: since 08:00 AM till 12:00 AM
2. Registration of participants, who are living in the hotel "Grand", at the
   lobby of the hotel "Grand",
   - Thursday 27.08.2009. since 02:00 PM till 10:00 PM
3. Conference opening - room "Holidej", hotel "Suncani vrhovi"
4. All plenary seccions - room "Holidej", hotel "Suncani vrhovi"
5. Workshop S1 - room "Holidej", hotel "Suncani vrhovi"
6. Workshop S2 - room "Malo jezero", hotel "Suncani vrhovi"
7. Workshop S3 - room "Prezident", hotel "Suncani vrhovi"
8. Workshop S4 - room "Prezident", hotel "Suncani vrhovi"
9. Workshop S5 - room "Prezident", hotel "Suncani vrhovi"
10. Working group W1 - room "Prezident", hotel "Suncani vrhovi"

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ПЛЕНАРНЫЕ ДОКЛАДЫ   зал "Холидей" гостиницы "Сунчани Врхови"

Август, 28 (день второй)

	Страна	Авторы	Докладчик	Доклад
9:30	Председатели: Hranislav Milosevic, Юрий Иванович Шокин			
	Сербия	Milovanovic G.	Milovanovic Gradimir	Numerical treatment of Fredholm integral equations
	Россия	Гурарий М.М., Русаков С.Г., Стемпковский А.Л., Ульянов С.Л., Жаров М.М.	Русаков Сергей Григорьевич	Вычислительные аспекты адаптивного метода гармонического баланса в схемотехническом моделировании
	Казахстан	Данаев Н.Т.	Данаев Нагрозы Турсынбаевич	Итерационные алгоритмы для решения сеточных уравнений Навье-Стокса
11:00	перерыв			
11:30	Председатели: Gradimir Milovanovic, Сергей Григорьевич Русаков			
	Россия	Бычков И.В.	Бычков Игорь Вячеславович	Инфраструктура пространственно-распределенных данных в задачах управления региональным развитием
	Россия	Голушко С.К., Голушко К.С.	Голушко Сергей Кузьмич	О некоторых постановках обратных задач механики композитных пластин и оболочек и методах их решения
	Россия	Захаров Ю.Н., Зеленский Е.Е., Потапов В.П., Счастливцев Е.Л., Толстых М.А.	Захаров Юрий Николаевич	Об одной модели подземной газификации угля
13:30	Обед			

Август, 29 (день третий)			
9:00	Председатели: Mijajlovic Zarko, Владимир Викторович Шайдуров		
	Сербия	Mijajlović Ž.	Mijajlovic Zarko	Application of information science in digitization of scientific and cultural heritage
	Россия	Шайдуров В.В., Карепова Е.Д.	Шайдуров Владимир Викторович	Математические аспекты параллельных реализаций МКЭ для краевой задачи для уравнений мелкой воды
	Россия	Белолипецкий В.М., Белолипецкий П.В., Генова С.Н., Дегерменджи А.Г., Рогозин Д.Ю.	Белолипецкий Виктор Михайлович	Одномерная модель вертикальной структуры соленого озера
11:00	перерыв		
11:15	Израиль	Beisel S., Chubarov L., Kit E., Levin A., Shokin Yu., Sladkevich M.	Kit Eliezer	Анализ возможных волн цунами у Израильского берега Средиземного моря
	Россия	Смагин С.И.	Смагин Сергей Иванович	О численных методах решения задач дифракции в интегральных постановках
	Россия	Фионов А.Н., Рябко Б.Я.	Фионов Андрей Николаевич	Теоретико-информационные методы решения задач стеганографии
	Кыргызстан	Жайнаков А.Ж.	Жайнаков Аманбек Жайнакович	Численный расчет электрической дуги методом установления
13:30	Обед		

Август, 30 (день четвёртый)

Время		Страна	Авторы	Докладчик	Название
9:00	Председатели: Bozidar Radenkovic, Анатолий Михайлович Федотов				
		Россия	Федотов А.М.	Федотов Анатолий Михайлович	Проблемы интеграции информационных ресурсов
		Россия	Белов Ю.Я., Фроленков И.В.	Белов Юрий Яковлевич	Некоторые задачи идентификации коэффициентов параболических уравнений
		Россия	Москвичев В.В.	Москвичев Владимир Викторович	Прикладные задачи вероятностного риск-анализа технических систем
11:00	перерыв				
11:15	Председатели: Dojcin Petkovic, Юрий Яковлевич Белов				
		Сербия	Radenković B.	Radenkovic Bozidar	Information technologies and religion
		Сербия	Banjanin M., Miladinović D.	Milorad Banjanin	Ontology Concepts of Multiagent Systems
		Россия	Афанасьев К.Е., Рейн Т.С., Карабцев С.Н.	Афанасьев Константин Евгеньевич	Численное моделирование задач гидродинамики со свободными границами методом естественных соседей
		Россия, Сербия	Рычков А.Д., Шокин Ю.И., Милошевич Х.	Милошевич Хранислав	Применение импульсной аэрозольной системы пожаротушения для борьбы с пожарами в угольных шахтах
13:30	Обед				

СЕКЦИОННЫЕ ДОКЛАДЫ

	Страна	Авторы	Докладчик	Доклад
Август, 28 (день второй)				
Секция 1		зал "Холидей" гостиницы "Сунчани Врхови"		
14:30	Председатели: Rajović Miloje, Виталий Евгеньевич Распопов			
	Сербия	Cvejic S., Lekic M., Dimitrovski D.	Cvejic Stana	Properties of coefficients of analytical periodic functions
	Россия	Лемперт А.А., Горнов А.Ю.	Лемперт Анна Ананьевна	Алгоритм стохастической аппроксимации множества достижимости управляемой системы на плоскости
	Сербия	Petrovic I., Stefanovic C., Sekulovic N., Petrovic M., Stefanovic M.	Petrovic Ivana	Second order statistics of ratio of two random variables
	Сербия	Petrovic I., Petrovic M., Spalevic P.	Petrovic Ivana	Second order statistics of SC diversity system in the presence of fading
	Сербия	Petkovic D., Arandjelovic I.	Petkovic Dojcin	On the convergence of diagonal approximation
	Сербия	Milovanovic G., Spalevic M., Paunovic L.	Paunovic Ljiljana	Error bounds of Gauss-Turan-Kronrod quadratures with Gori-Micchelli weight functions for analytic functions
	Греция	Leontitsis A., Lekkas E., Pange J.	Pange Jenny	A simulation approach on Cronbach's alpha statistical significance
16:30	перерыв			

Август, 28 (день второй)			
Секция 1	зал "Холидей" гостиницы "Сунчани Врхови"		
16:45	Председатели: Nikolai Vasilievich Chemetov, Семен Яковлевич Серовайский		
	Казахстан	Серовайский С.Я.	Серовайский Семен Яковлевич	Задача идентификации параметров для нелинейных осциллирующих систем
	Сербия	Kevkić T.S., Petković D.M.	Kevkić Tijana S.	Some analytical solution of nonlinear poisson equation for inversion layer of mos structure
	Сербия	Vujaković J., Rajović M.	Vujaković Jelena	An idea for determination of zeros locations of complex differential equations
	Сербия, Македония	Dimitrovski D., Vujakovic J., Rajovic M.	Vujakovic Jelena	On location of zeros of second order complex differential equations
	Сербия	Cvejic S., Lekic M., Dimitrovski D.	Cvejic Stana	Oscillating solutions of the equation $y''+a(x)*y=0$ for small values of the coefficient $a(x)$
	Сербия	Cvetkovic S., Cvetkovic M.	Cvetkovic Slavica	Modelirannje I analiza performance proizvodnog sistema korišće-njem Petrijevih mreža I markovih lanaca
18:30	Завершение работы		

Август, 28 (день второй)			
Секция 2	зал "Мало езеро" гостиницы "Сунчани Врхови"		
14:30	**Председатели: Michael Sladkevich, Василий Васильевич Максимов**		
Израиль	Sladkevich M.	Sladkevich Michael	Numerical Simulations of Long Waves Processes at Coastal Zone Using Shallow Water Model. In Memory of Dr. A.N. Militeev (1943-2003)
Россия	Бейзель С.А., Худякова В.К., Чубаров Л.Б., Шокин Ю.И.	Чубаров Леонид Борисович	Моделирование оползневого механизма генерации волн цунами у Средиземноморского побережья Израиля
Россия	Карепова Е.Д., Малышев А.В., Шайдуров В.В.	Карепова Евгения Дмитриевна	Исследование эффективности параллельных реализаций МКЭ для краевой задачи для уравнений мелкой воды
Германия	Dedner A., Kröner D., Shokina N.	Shokina Nina	Adaptive modelling of two-dimensional shallow water flows with wetting and drying
Россия	Турчановский И.Ю.	Турчановский Игорь Юрьевич	Параллельная реализация алгоритма решения задач динамики пучков заряженных частиц методом "частицы-в-ячейках"
Россия	Khabakhpasheva T.I.	Хабахпашева Татьяна Ивановна	Entry and exit of an elastic shell on a thin layer of the water
Россия	Максимов В.В., Нуднер И.С.	Максимов Василий Васильевич	Взаимодействие гравитационных волн с частично проницаемыми преградами
16:30	**перерыв**		

Август, 28 (день второй)

Секция 2	зал "Мало езеро" гостиницы "Сунчани Врхови"		
16:45	**Председатели: Канат Кожахметович Шакенов, Георгий Алексеевич Хабахпашев**		
Россия	Архипов Д.Г., Верещетин И.А., Хабахпашев Г.А.	Хабахпашев Георгий Алексеевич	Неустойчивость линейных и нелинейных гравитационных волн на границе раздела двухслойного течения Пуайзеля
Казахстан	Шакенов К.К.	Шакенов Канат Кожахметович	Численное моделирование одной модели релаксационной фильтрации
Россия	Перегудин С.И., Холодова С.Е.	Холодова Светлана Евгеньевна	О геострофических движениях во вращающемся сферическом слое неоднородной электропроводной жидкости
Россия	Якубайлик Т.В., Компаниец Л.А.	Якубайлик Татьяна Валерьевна	О некоторых аналитических решениях модели ветрового движения вязкой несжимаемой жидкости (трехмерный случай)
Россия	Мартюшов С.Н.	Мартюшов Сергей Николаевич	Расчет дифракции ударной волны на теле как тест на точность по времени.явного алгоритма
Россия	Захаров Ю.Н., Гейдаров Н.А.	Захаров Юрий Николаевич	Устойчивость решения стационарной задачи о течении вязкой несжимаемой жидкости, вызванной заданным перепадом давления
18:30	**Завершение работы**		

Август, 28 (день второй)

Секция 3	зал "Президент" гостиницы "Сунчани Врхови"		
14:30	Председатели: Vladica Stojanovic, Nathan Blaunstein		
Израиль	Blaunshtein N.	Blaunstein Nathan	Modeling of Radio Propagation in the Land-Satellite Link through the Stormtime Ionosphere
Сербия	Odalović M.T., Petković D.M.	Odalović Mihajlo T.	A stochastic model of gamma-ray induced charge in silicon dioxide films of mos transistors
Сербия	Popovic B., Stojanovic V.	Stojanovic Vladica	Discrete autoregressive model of conditional duration
Сербия	Stamenkovic N., Stojanovic V.	Stamenkovic Negovan	Signal processing simulation based on the residue number system
Сербия	Mitić D.Z., Petković D.M.	Petkovic Dojcin	Characterization of heavy doped semiconductors using analytical approximation of Fermi integrals
Сербия	Petrović L., Stanojević D., Dimitrijević S.	Stanojević Dragana	Statistical causality, weak solutions and martingale problems of stochastic differential equations driven with brownian motion
Сербия	Raicevic A., Prica B.	Raicevic Andelija	One solution for differential equation for non-linear mode PLL loop
16:30	перерыв		

Август, 28 (день второй)

Секция 4	зал "Президент" гостиницы "Сунчани Врхови"		
Председатели: Cemal Dolicanin, Виктор Константинович Андреев			
16:45	Сербия	Petkovic D., Petrovic M.	Petrovic Milena	A truly third order finite volume scheme on quadrilateral mesh
	Россия	Косогоров О.М., Макаров А.А.	Макаров Антон Александрович	Spline wavelet decomposition and parallel compression
	Сербия	Radosavljević D., Ristić J., Milojević S., Milenković N.	Radosavljević Dragana	MS Excel in mathematics
	Сербия	Božinović M.	Božinović Milan	Mathematical model of monopoly competition
	Сербия	Popovic Z., Bogdanovic S.	Popovic Zarko	Mathematical modelling of capital reinsurance
18:30	Завершение работы		

Август, 29 (день третий)

Секция 1	зал "Холидей" гостиницы "Сунчани Врхови"		
Председатели: Dojcin Petkovic, Наргозы Турсынбаевич Данаев			
14:30	Сербия	Pavićević Z.	Pavićević Žarko	Hyperbolic geometry, curvilinear angles and points of porosity in investigation of boundary properties of functions
	Португалия	Chemetov N.V.	Chemetov Nikolai Vasilievich	Strongly Nonlinear Hyperbolic - Elliptic Problem in a Bounded Domain

Сербия	Mandak A.	Mandak Alija	On construction weighted projective plane of order 4 and (2, 4 − 1)-quasigroup
Сербия	Vujaković J., Radenović S.	Vujaković Jelena	Some result on cone metric spaces
Сербия	Ljajko E., Pavličić Z.	Ljajko Eugen	Geogebra and high school analytic geometry instruction
Сербия	Radenković N.	Radenković Nataša	Data warehouse solutions for CRM
Сербия	Dolicanin D., Stefanovic M.	Dolicanin Diana	About a properties of divergent closed trajectories

16-30	перерыв

Август, 29 (день третий)

Секция 1	зал "Холидей" гостиницы "Сунчани Врхови"
16:45	Председатели: Milenko Pikula, Аманбек Жайнакович Жайнаков

Босния и Герцеговина	Pikula M., Vladičić V.	Pikula Milenko	About structures on the set of triangles
Россия	Распопов В.Е.	Распопов Виталий Евгеньевич	Численная идентификация свободного члена специального вида параболического уравнения
Сербия	Meštrović R., Pavićević Z.	Meštrović Romeo	Topologies on the Privalov spaces with applications in the theory of Banach algebras
Сербия	Gajic L.	Gajic Ljiljana	A fixed point theorem for mappings with a concractive iterate at a point on D*-metric spaces

Кыргызстан	Жайнаков А.Ж., Аширбаев Б.ы.	Жайнаков Аманбек Жайнакович	Аналитическое конструирование линейного регулятора по сингулярным возмущениям
Босния и Герцеговина	Vukovic M.	Vukovic Mirjana	Krasner's and Vukovic's Paragraduations
Сербия	Stevanovic M.R.	Stevanovic Milorad	Spence birational transformation in series
18:30 Завершение работы			

Август, 29 (день третий)

Секция 2	зал "Мало езеро" гостиницы "Сунчани Врхови"		
14:30 Председатели: Hranislav Milosevic, Александр Васильевич Старченко			
Сербия	Милошевич Х.М.	Милошевич Хранислав	Application of low-temperature plasma in steel-making converters
Россия	Казаков А.Л.	Казаков Александр Леонидович	Применение обобщенной задачи Коши для описания сложных течений газа с ударными волнами
Россия	Старченко А.В., Барт А.А., Беликов Д.А., Данилкин Е.А.	Старченко Александр Васильевич	Мезомасштабные модели высокого разрешения для исследования качества атмосферного воздуха в городах
Сербия	Petrovic V. V.	Petrovic Vera	Kinetics of sintering with mathematical theory of Gropjanov
Россия	Амелина Е.В., Голушко С.К., Юрченко А.В.	Юрченко Андрей Васильевич	Вычислительные аспекты моделирования и анализа поведения композитных пластин и оболочек

Россия	Минаков А.В., Дектерев А.А.	Минаков Андрей Викторович	Новый численный алгоритм для моделирования несжимаемых течений жидкости со свободной поверхностью и подвижными твердыми телами
Россия	Гаврилов А.А., Дектерев А.А.	Гаврилов Андрей Анатольевич	Численное моделирование нестационарного кавитационного течения при обтекании гидрокрыла
16:30	**перерыв**		

Август, 29 (день третий)

Секция 2	зал "Мало езеро" гостиницы "Сунчани Врхови"		
Председатели: Сауле Джумакановна Маусумбекова, Леонид Борисович Чубаров			
16:45	Россия	Андреев В.К.	Андреев Виктор Константинович	Движение двух теплопроводных жидкостей в цилиндрической трубе
	Сербия	Dolicanin C., Nikolic V., Radojkovic M.	Nikolic Vera	Mathematical models and application of numerical methods in solving a phenomenon of the theory of thin plates
	Россия	Федотова З.И., Хакимзянов Г.С.	Федотова Зинаида Ивановна	Нелинейно-дисперсионные уравнения мелкой воды на вращающейся сфере.
	Казахстан	Маусумбекова С.Д., Найманова А.Ж.	Маусумбекова Сауле Джумакановна	Численное моделирование обтекания сжимаемым потоком двух тел, расположенных тандемом

	Россия	Садовская О.В., Садовский В.М.	Садовская Оксана Викторовна	Численное моделирование процессов распространения волн в упругопластических и сыпучих средах на многопроцессорных вычислительных системах
	Россия	Любашевская И.В., Банщикова И.А.	Любашевская Ирина Васильевна	Деформирование пластин из сплавов с разными свойствами на растяжение и сжатие при ползучести
18:30	Завершение работы			

Август, 29 (день третий)

Секция 5   зал "Президент" гостиницы "Сунчани Врхови"

Председатели: Damnjan Radosavljević, Михаил Петрович Федорук

14:30				
	Россия	Шокин Ю.И., Федорук М.П., Чубаров Д.Л., Юрченко А.В.	Федорук Михаил Петрович	Об организации деятельности ресурсных центров распределенной информационно-вычислительной среды
	Россия	Лямина В.А., Зольников И.Д., Королюк А.Ю., Добрецов Н.Н., Смоленцев Б.А., Глушкова Н.В.	Добрецов Николай Николаевич	Картографирование и мониторинг гетерогенных ландшафтов методами ГИС и ДЗ
	Россия	Мартысевич У.В., Болдырев И.И., Добрецов Н.Н.	Добрецов Николай Николаевич	Методики коррекции и предварительной обработки мультиспектральных данных для моделирования геологических и ландшафтных обстановок

Россия	Якубайлик О.Э.	Якубайлик Олег Эдуардович	Геоинформационная Интернет-система мониторинга состояния окружающей природной среды в зоне действия предприятий нефтегазовой отрасли
Россия	Массель Л.В.	Массель Людмила Васильевна	Интеграция распределенных информационных ресурсов для исследований энергетики
Сербия	Radosavljević D., Trajkovic S., Ralevic P., Panic S.	Radosavljević Damnjan	Information system of student services done in programs C++
16:30	перерыв		

Август, 29 (день третий)

Секция 5	зал "Президент" гостиницы "Сунчани Врхови"		
16:45	Председатели: Dragan Radovanović, Николай Николаевич Добрецов		
Сербия	Valjarevic A., Radovanović D., Birovljev N.	Valjarevic Aleksandar	Application of Geographical information system on the maps
Россия	Пчельников Д.В., Добрецов Н.Н., Сладких Л.А.	Добрецов Николай Николаевич	Построение системы прогнозирования урожайности на основе объектно-ориентированной архитектуры систем мониторинга
Казахстан	Балакаева Г.Т., Актымбаева А.С.	Балакаева Гульнар Тултаевна	Simulation model for the fault-tolerant systems
Россия	Решетникова Г.Н.	Решетникова Галина Николаевна	Следящие системы адаптивного управления экономическими процессами

Сербия	Banjanin M., Drakulić G.	Milorad Banjanin	Interoperability of information-communication and spatial information infrastructure
Россия	Рогалев А.Н.	Рогалев Алексей Николаевич	Исследование безопасности сложных систем и оценки областей допустимых отклонений
Сербия	Radosavljević D., Trajkovic S., Predrag R., Petrovic S.	Radosavljević Damnjan	Creating WEB applications using FrontPage and Access
18:30	Завершение работы		

СТЕНДОВЫЕ ДОКЛАДЫ

Страна	Авторы	Докладчик	Доклад

Сентябрь, 1 (день шестой)

Председатели: Владимир Викторович Шайдуров, Юрий Николаевич Захаров

Страна	Авторы	Докладчик	Доклад
Россия	Варыгина М.П., Садовский В.М.	Садовский Владимир Михайлович	Параллельные вычисления в задачах динамики моментного континуума Коссера
Россия	Захаров Ю.Н., Гейдаров Н.А.	Захаров Юрий Николаевич	О градиентном расширении метода последовательной верхней релаксации (SOR) решения систем линейных и нелинейных алгебраических уравнений
Россия	Маджара Т.И.	Маджара Тарас Игоревич	Адаптивная технология решения задач оптимального управления с вычислительными особенностями
Россия	Каменщиков Л.П.	Каменщиков Леонид Петрович	Решение уравнений мелкой воды Lattice Boltzmann методом с распараллеливанием
Россия	Захаров Ю.Н., Иванов К.С.	Иванов Константин Станиславович	Численное решение трехмерных нестационарных уравнений Навье-Стокса в переменных «вихрь - векторный потенциал»
Россия	Бекежанова В.Б.	Бекежанова Виктория Бахытовна	Неустойчивость стационарного двухслойного течения жидкости при наличии продольного градиента температуры

Страна	Авторы	Докладчик	Название
Казахстан	Даирбаева Г.	Даирбаева Гульзазата	Градиентные методы решения некорректной задачи Коши
Казахстан	Орынбасаров М.	Орынбасаров Мамажан	Boundary problem for parabolic equation with discrete coefficients

Сентябрь, 2 (день седьмой)

Председатели: Виктор Михайлович Белолипецкий, Сергей Кузьмич Голушко

Страна	Авторы	Докладчик	Название
Россия	Барановский Н.В., Кузнецов Г.В.	Барановский Николай Викторович	Математическое моделирование зажигания лиственного дерева грозовым разрядом облако-земля с учетом локализации реактивной древесины
Россия	Барановский Н.В., Кузнецов Г.В.	Барановский Николай Викторович	Влияние m-компонентов наземного грозового разряда на процесс зажигания дерева хвойной породы
Россия	Банщикова И.А.	Банщикова Инна Анатольевна	Моделирование анизотропной ползучести с использованием теории Хилла
Россия	Архипов Д.Г., Хабахпашев Г.А., Литвиненко А.А., Сафарова Н.С.	Хабахпашев Георгий Алексеевич	Сравнение численных решений по различным моделям для нелинейных планарных волн на свободной поверхности неглубоких жидкостей
Казахстан	Камалова Г.А., Рамазанова Г.И.	Камалова Гаухар Абдумугалиповна	Численное моделирование взаимодействия твердых частиц с газовым потоком
Россия	Шайдуров В.В., Щепановская Г.И.	Щепановская Галина Ивановна	Вычислительный эксперимент сферически-симметричного моделирования глубинной геодинамики

Сентябрь, 3 (день восьмой)		
Председатели: Гульнар Туптаевна Балакаева, Игорь Вячеславович Бычков		
Россия	Шокин Ю.И., Клименко О.А., Рычкова Е.В.	Рычкова Елена Владимировна	Рейтинг сайтов научных организаций Республики Сербия
Россия	Кобалинский М.В., Сибгатулин В.Г., Симонов К.В., Перетокин С.А., Худобердин И.Р., Краснораменская Т.Г.	Кобалинский Михаил Викторович	Информационно-вычислительная технология для оценки геодинамических рисков
Россия	Чернякова Н.А.	Чернякова Наталья Александровна	Использование метода Монте-Карло в оценках надежности элементов конструкций
Россия	Москвичева Л.Ф., Буров А.Е., Богульская Н.А.	Москвичева Людмила Федоровна	Модульный магистерский курс «Системы автоматизированного проектирования и инженерного анализа»
Россия	Решетников М.Т.	Решетников Михаил Терентьевич	Математика и информационные технологии в российских образовательных стандартах
Россия	Шарапов Р.В., Шарапова Е.В.	Шарапов Руслан Владимирович	Определение ссылочного спама на основе анализа контента
Россия	Шигаров А.О.	Шигаров Алексей Олегович	Система автоматизации извлечения табличной информации из электронных документов разных форматов
Россия	Шахов В.В.	Шахов Владимир Владимирович	Теоретические основы оценки эффективности средств противодействия атаке TCP SYN Flooding
Россия	Шахов В.В.	Шахов Владимир Владимирович	Аппроксимация функции потерь Эрланга и ее применение
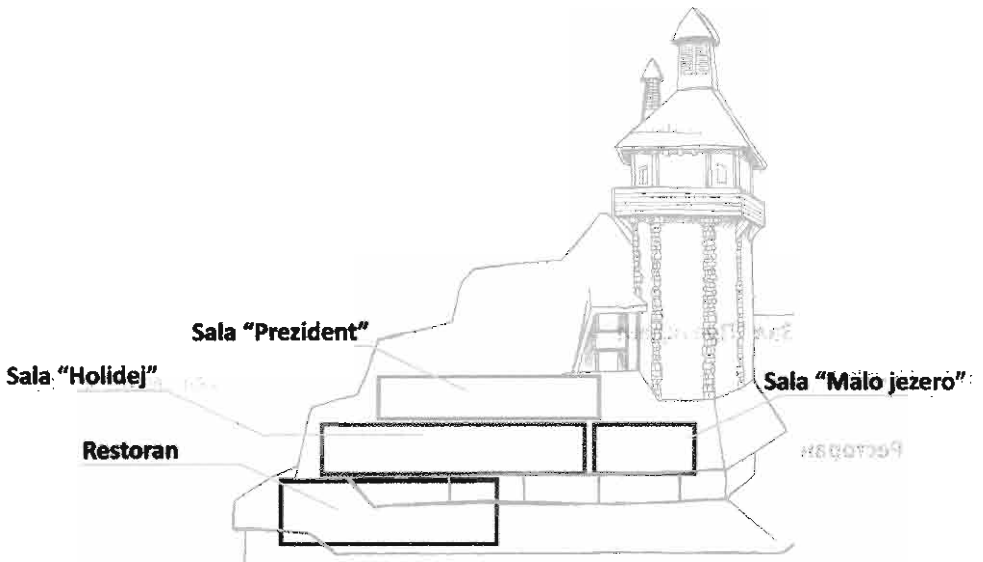
Raspored sala
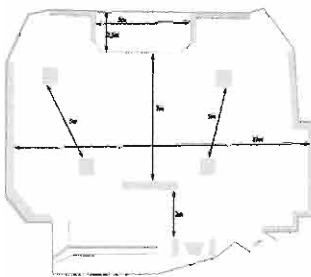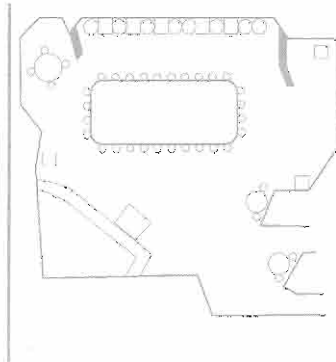
Sala "Holidej"   Sala "Prezident"   Sala "Malo jezero"
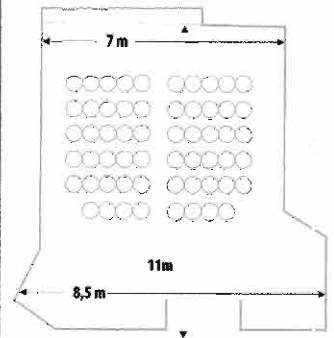
Šematski prikaz sala

Местоположение залов

Зал "Холидей"   Зал "Президент"   Зал "Мало езеро"

7 m

11m

8,5 m

Схемы залов

Room "Prezident"

Room "Holidej"

Restaurant

Room "Malo jezero"
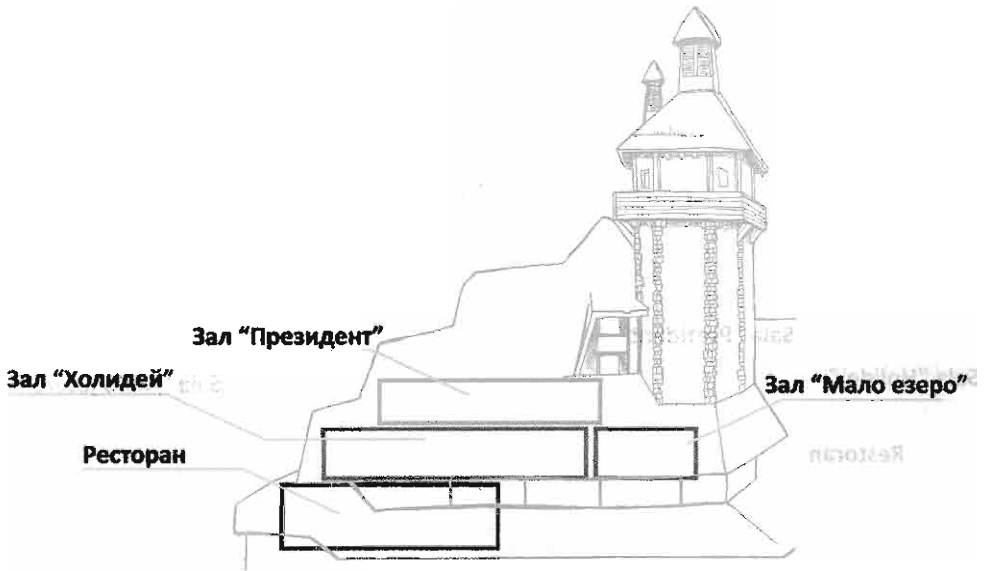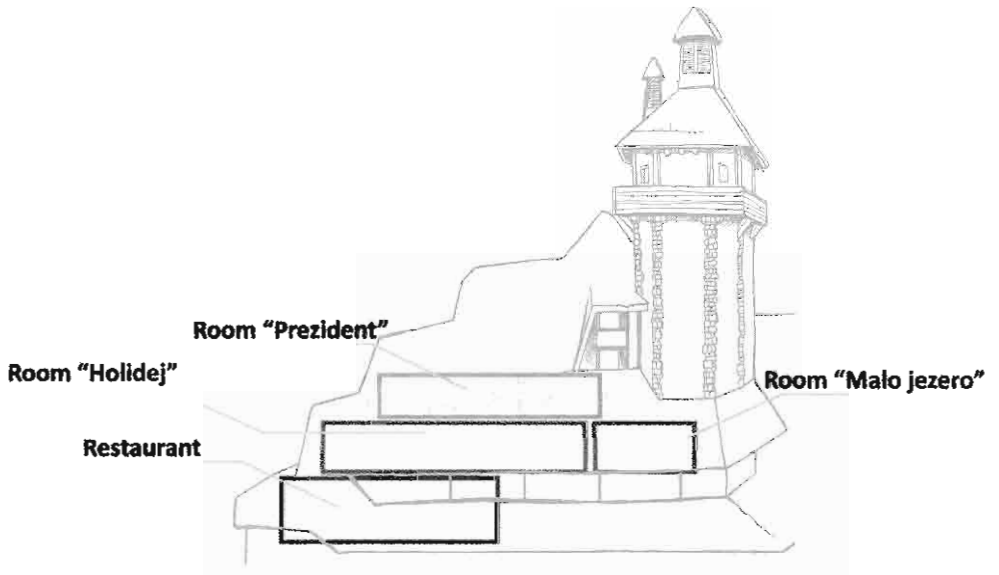
Conference rooms position

Room "Holidej"   Room "Prezident"   Room "Malo jezero"
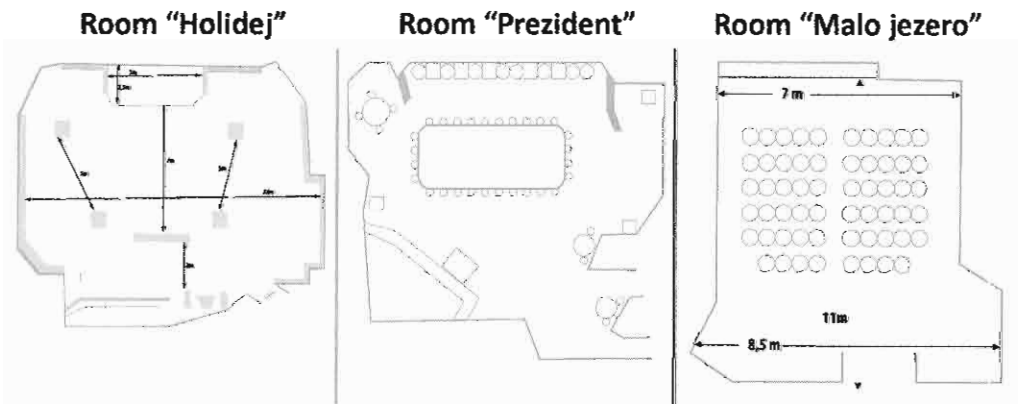
Conference rooms scheme

ABSTRACTS

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The aspects of numerical methods implementation when modeling and analyzing the behavior of composite plates and shells

We are considering the problems of numerical modeling and the behavior analysis of composite plates and shells. Thus problems are especially brightly shown in case we use nonclassical improved theories of plates and shells in a combination with structural models of a composite material. One of the peculiarities of corresponding boundary-value problems is the presence of rapidly changing components in their decisions and strong boundary effects. Because of that the use of traditional numerical schemes and algorithms becomes impossible.

The offered approach to the solving of two-dimensional boundary-value problems of theories of plates and shells is in the reducing of the dimension of a problem. It is reached by representing the components of the solution in the form of finite trigonometrical series. The order of a system of ordinary differential equations of the final one-dimensional problem is generally proportional to the number of kept harmonics in the series expansion of required functions. Though there are parameters of the initial problem of the stressed-deformed state of composite plates and shells determination at which the final one-dimensional boundary value problem can be splitted into several independent sub-problems with the smaller order of the system of equations.

To solve the aroused one-dimensional boundary-value problems two methods are used: the method of discrete orthogonalisation, realized by authors in software package GMDO, and the method of spline-collocation, realized in software package COLSYS. The application of two essentially different numerical methods allows us to raise the reliability of received results. Wide researches of possibilities and peculiarities of using of the method of discrete orthogonalisation use for solving ill-conditioned boundary-value problems of mechanics of composite plates and shells are conducted. The algorithms of an automatic choice of a grid step and a distribution of orthogonalisation nodes are developed to provide stable calculation process.

The application of offered techniques is demonstrated on the solution of problems of determination and analysis of the stressed-deformed state of the round multilayered reinforced plates with the round central or displaced aperture. The question of necessary number of harmonics kept in series is investigated. The comparison of efficiency of numerical algorithms is carried out. Besides, the influence of a choice of used variants of the theory of plates and shells, models of a composite material on results of calculations, structural parameters of a composite material and geometrical parameters of plates on their stressed-deformed state is investigated. In that specific case, at isotropic layers and the central aperture, analytical solutions are received and used to investigate accuracy of applied numerical algorithms.

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The motion of two heat condacting liquids in a cylindrical pipe

We shall consider the joint non-stationary motion of two immiscible viscous heat conducting liquids with an common interface in a cylindrical pipe. Suppose, that the densities, the kinematic viscosities and the thermal diffusivities of the liquids are positive constants. We also assume that there no external mass forces acting on the liquids. Under these assumptions, the equations of continuity, momentum and energy in the cylindrical coordinates admit the specific one-parameters subgroup of transformations. The invariant solution corresponding to this subgroup can be interpreted as follows. Suppose that on the cylindrical interface between liquids the surface tension linearity depends on the temperature. Initially, the liquids are at rest and occupy the cylindrical domains, respectively. At the initial time the temperature fields which are linearity depend on coordinate along pipe, instantly created in the whole domains. The thermocapillary effect and non-stationary pressure gradients induce the motion of liquids. In this motion, the interface remains cylindrical surface and the trajectories are straight lines parallel to the axes of pipe. The liquid layer near rigid wall of pipe may be interpreted as a lubricant. The required velocities and temperatures can be called as the perturbations of the quiescent state of liquids. Substituting the invariant expressions of the velocities and temperatures in the governing equations and taking into account the conditions on the interface, we obtain the three conjugate initial boundary value problems for unknowns. These problems can be solved successively.

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Instability of linear and nonlinear gravity waves on an interface of the two layered Poiseuille flow

The stability of the two layered Poiseuille flow in a plane horizontal channel is considered. The problem in the linear order is reduced to a pair of Orr – Sommerfeld equations with homogeneous boundary conditions on the interface, lid and bottom of the channel. As is well known there are many modes of disturbances with different phase velocity. Although the linear stability problem of two superposed immiscible viscous liquids was detailed researched [1] no special attention was paid to gravity mode. However interac-

tion of such waves with the flow is interesting. Due to numerical stiffness of Orr – Sommerfeld equation we used special algorithms such as compound matrix method [2] and Abramov's method [3]. As a result we received the dependences of phase velocity and amplification factor of disturbances on the wave number for different flow speed. It is shown that long gravity waves can be unstable. Moreover under some circumstances the gravity mode is only one long unstable wave. The reason of this instability is the flow velocity joint on the interface. In the case when the viscous effects are strong (α Re << 1, where α is the wave number and Re is the Reynolds number) it corresponds to well known interface instability [4]. Also profiles of velocity disturbances were calculated. Based on the velocity profiles received from linear analysis the nonlinear evolution equation for the interface disturbance of two layered flow was obtained like it was done in the paper [5]. Coefficients in the equation are presented as integrals on layers from function depended from flow and disturbance profiles. Notable that coefficient at dissipative member changes the sign in the region of linear instability. This fact corresponds to energy pumping from basic flow to the flow disturbances.

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Comparison of numerical solutions by different models for nonlinear planar waves on a free surface of shallow liquids

At the recent decades much attention of researchers has been attracted to essentially three-dimensional finite-amplitude disturbances (for instance,

books [1–3]). However, most models (e.g., papers [4–6]) are applicable only to nonlinear waves propagating chiefly in one direction. Only in these cases the problem is reduced to one equation for the perturbation of the free surface. For this reason, finite-amplitude waves travelling simultaneously in different directions can be described only by systems of equations incorporating both the disturbance of the free boundary and the fluid velocity. In the systems proposed earlier (for example, [7–9]), even the linear terms of all equations involve terms depending on the fluid velocity. The new combined system of equations, which is more well-behaved was proposed in the paper [10]. There are assumed that liquid is incompressible, its stationary flow is absent, the disturbance amplitudes are small but finite, characteristic horizontal lengths of waves and of the bottom topography are larger and the thickness of unsteady viscous boundary layer is smaller than the fluid depth, and finally, capillary effects are moderate. The initial system of the Stokes equations and of the continuity equation for the shallow water above a gently sloping bottom was reduced to one basic nonlinear evolution equation for spatial perturbations of the free surface and two linear auxiliary differential equations for a determination of the horizontal velocity vector averaged over the layer depth which is contained in the main equation only in one term of the second order of smallness. The suggested model is suitable for finite-amplitude waves running on any angles. Even in the case of inviscid liquids this approach is in essence easier than known systems of equations, where all equations contain both linear and nonlinear items (e.g., [7–9]). Some solutions of our model equations were found numerically. The calculations according to the model [6] were performed with the help of the implicit three-layer difference scheme, which is described in detail in the paper [11]. This scheme has the second order of approximation in all variables. The results of several numerical experiments for a transformation of initially plane moderately long nonlinear waves were adduced in the paper [11] too. A dynamics of the three-dimensional disturbance which is solitary in the space were demonstrated in the paper [12]. The calculations according to the model [10] were carried out in the following way. At the step "predicator" the calculations were made with the help of the simplest replacement for the velocity vector. At the step "corrector" the velocity vector was determined using the simple linear auxiliary equations. Poisson's equation for a determination of the velocity vector was resolved by the method of the fast Fourier transformation by both horizontal coordinates on the each step of time. Formally the evolution equation of the model [6] allows to study a collision of two plane waves running towards each other. But it is shown that at the point of time of their maximal interaction the calculation error may be equals 10 % approximately. A comparison of the numerical results for three-dimensional solitary in the space perturbations of small but finite amplitude was carried out too. Some test solutions were found in the pools with different topographies. As it should be not only the changing of the wave velocities but also the intensification of disturbances moving towards the lower liquid depth and other-

wise their weakening when the waves are moving to the deeper area were observed. It is seen, that the additional peaks and troughs took place over the bottom irregularities.

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Simulation model for the fault-tolerant systems

In this paper we consider a fault-tolerant and Real -Time Robotic system that can communicate between each other only via message sending. The paper proposes algorithm to provide group membership and view synchrony among robots. In such systems may happen failures, in particular when a certain number of robots can possibly crash.

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Ontology Concepts of Multiagent Systems

Defining ontology for the MAS will be realized by the fundamental specification collaborations and relations that exist between the participants in the SC and the set of rules (or axioms) that restrict the semantics of the concepts and relations in ontology. The development and presentation of the MAS ontology are based on the union of concepts presented as 4S: [Streams, Structures, Scenarios, Societies], where for each "S" there is a concept and relation in which they take part. The general meaning of the MAS ontology can be presented as an arranged set Ω=(Ontol_Concepts, Ontol_Rels) [3], in which Ontol_Concepts represent a family of ontology concepts, and Ontol_Rels a family of relations between the concepts.

This work focuses on ontologies for multiagent systems that are now increasingly used in modelling the distributed and autonomous characteristics of different entities involved in logistic flows. Knowledge and information on logistic flows originate from different participants, so efficient communication and inter-exchange of information between agents should be based on ontologies. Ontologies have the role of semantic knowledge organization and as such they simplify sharing and reuse of knowledge between the participants in supply chain. In that way it is possible to increase responsibility and efficiency of logistic processes, whereas an application of ontology on all entities in supply chain enables the efficient increase in materials, finance and information flow management in different phases of supply chain.

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Interoperability of information-communication and spatial information infrastructure

The relatively newer idea in projects of European Union is about information-communication (IC) and spatial information infrastructures interoperability. This work is focused on specificities of transportation markets in the designing of the new and optimization of existing portfolio of services through „3-eff" integration of the technical, human, finance and IC resources in the different space domains. Efficient IC infrastructure of transportation may be achieved only through the application of authentic registers (or „key

registers") for warehousing critical data which are interoperable in the wider geographic space and accessible for the cooperation, coordination and collaboration by the multiple usages of different users.Spatial information and information-communication infrastructure for transport services   The complex approach to the analysis of spatial information infrastructure (SII) and information-communication infrastructure (ICI) in transport industry enables the reinforcement of transport service realisation processes, namely the augmentation of their quality and level of user desires satisfaction. Simultaneously, this work represents an important resource for the design of transport resource administration domain model and establishing the transformation directions of SII and ICI roles in the modern transport service providers' business. That question is different from the design of general networks and primary algorithmic improvements in effectiveness and efficiency of transport processes.

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Modeling anisotropic creep by using Hill's theory

At the problems solving of the shaping thin-sheet details made of modern constructional alloys and forecasting of their further successful it is necessary to take into account features of strain-strength behaviour of a material. The properties of anisotropy on directions (along, across, on a normal to a plate) and different resistance to a tension and compression, hardening and softening at creep have the majority of sheet materials that make mathematical simulation of process of shaping very difficult. Anisotropic creep model equivalent to Hill's model for anisotropic plasticity was tested on the problems of a stretching of cubic samples by using of finite-element program ANSYS. Factors of anisotropy have been determined in view of possible weaker deformation of sheet details on a normal to a sheet and under a corner 45. «The coefficient of anisotropy» on a normal to a sheet k was defined by averaging of the relation of the size change on thickness of a sheet (i.e. in a direction of a normal to a sheet) to the size change on width of a flat sample at various degrees of axial deformation from experiments on a stretching. In case of the shaping plane panels at creep with surfaces of complex contour special interest for testing is represented by problems of a bending of the square plate, which realize experimentally. Calculation by a method of finite-elements in three-dimensional statement, and also analytical estimations and numerical calculation in one-dimensional statement for problems of a

bending of a plate in a cylindrical surface and for problems of a torsions of a plate in a sign-variable saddle surface testify to essential influence of anisotropy on a normal to a sheet and about insignificant influence of anisotropy under a corner 45 in comparison with calculation in isotropic statement.

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Mathematical simulation of deciduous tree ignition by lightning cloud-to-ground discharge taking into account localization of reactive wood

Forests ignite as a result of cloud-to-ground lightning discharges [1]. Polarity, peak current and voltage, and also duration of action are basic characteristics of ground lightning discharges [2]. M-components, firstly described in [3], are observed as increase in brightness of the channel during a continuing current. M-components can have peak in a kA-range [4]. It is necessary to investigate influence of M-components on process of coniferous tree ignition to estimate expediency of addition existing empirical [5,6] and deterministic-probabilistic [7] methods of the forest fire danger forecast by subsystems of the account of presence of M-components of a lightning discharge. One-dimensional three-layer model [8] uses as physical and mathematical model of coniferous tree ignition by ground lightning discharge. The purpose of research is estimation of M-components influence on process of coniferous tree ignition by ground lightning discharge, and also determination of ignition conditions depending on discharge parameters. The scenario, when in a pine trunk strikes negative polarity discharge (duration 500 ms) with an average current 23.5 кА and voltage 100 kV, is considered. The current has 5 M-components. Ignition conditions were estimated by the criteria, obtained in [9]. Obvious dependence of ignition process as a result of Joule calorification from exposition time of a tree trunk by current of ground lightning discharge is established. Ignition conditions are obtained for the typical ground discharge (duration about 500 ms). The short discharge (duration less than 300 ms) with average volt-ampere characteristics does not lead to ignition of a coniferous tree trunk. The analysis of ground lightning discharge M-components influence has revealed weak dependence of ignition process from their presence. M-components of typical ground lightning discharges show only insignificant influence on process of coniferous tree ignition. Influence of M-components of a ground lightning discharge with high value of average current even less appreciablly. It is possible to make a conclusion, that there is no necessity to develop applied software for the purposes of the forecast of forest fire danger to take

into account presence of M-components. This fact allows to use more simple physical and mathematical models at construction of information-forecasting systems for needs of protection of forests from fires. Besides the database of such system may not contain the information concern M-components of a ground lightning discharge.

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Анализ возможных волн цунами у Израильского берега Средиземного моря

В рамках совместного Российско-Израильского проекта рассмотрены возможные источники волн цунами в Средиземном море, которые могут проявиться у израильского берега. С этой целью проанализированы исторические сведения о цунами в рассматриваемом регионе. В рамках модели мелкой воды проведено предварительное численное модели-

рование распространения волны цунами от источников, расположенных в разных регионах Средиземного моря (Сицилия, Эгейское море, южное побережье острова Крит, Кипр и районы в непосредственной близости к израильскому морскому шельфу). В качестве источников цунами были рассмотрены как тектонические механизмы, связанные с землетрясением, так и подводные оползни на израильском шельфе. В результате анализа имеющихся данных и предварительного моделирования было получено, что заметные значения высот волн цунами могут быть получены от источников, расположенных на израильском шельфе, а также от источников, расположенных на юге от Кипра. Даже большие волны, источники которых расположены в районе Сицилии и в Эгейском море слабо проявляются у израильского берега. В качестве примера, приводятся результаты моделирования и натурная запись Греческого цунами 9 июля 1956 года. При этом событии в районе источника высота волны достигала около 30 м, а у израильского берега (Яфо) высота волны составила только около 20 см, что было зафиксировано мареографом и получено нашим моделированием.

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Modeling of landslide mechanism of tsunami wave generation near the Mediterranean coast of Israel

Настоящая работа посвящена исследованию влияния особенностей реального рельефа дна на характеристики волнового режима, порождаемого движением подводного оползня. Используя в качестве модели оползня простейшее представление в виде твердого тела, авторы рассматривают различные типы движения, отличающиеся способами учета геометрических свойств рельефа подстилающей поверхности. Постановка задач для вычислительных экспериментов учитывает особенности рельефа дна акваторий, прилегающих к средиземноморскому побережью Израиля, а также соответствующие геодинамические условия. Авторами предложена иерархия модельных акваторий, позволяющая исследовать влияние различных эффектов на процесс волнообразования. Для моделирования волновых процессов в работе используются различные приближения теории мелкой воды (линейное, нелинейное

и нелинейно-дисперсионное). По результатам вычислительных экспериментов определены базовые неизменные характеристики волновых процессов и параметры, зависящие от особенностей законов движения оползня. Обсуждаются вопросы важности учета нелинейных и дисперсионных эффектов на различных стадиях развития исследуемых процессов. Анализ полученных в ходе исследования результатов показал, что в случае сильной неоднородности распределения угла наклона подстилающей поверхности вдоль трассы движения оползня, что, в частности, имеет место у Средиземноморского побережья Израиля, учет этого угла может существенно изменить амплитуды волн, генерируемых движением оползня типа «слайд». Эффект нелинейности естественно проявляется на мелководье, определяя характерные особенности отраженной от берега и распространяющейся в мористом направлении волны. Дисперсия оказывает свое влияние в области средних глубин, в том числе и на параметры волн, возникающих при остановке оползня, а также на глубоководье. Это влияние проявляется в уменьшении абсолютных значений порождаемых волн понижения и в образовании характерного цуга диспергирующих волн.

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Instability of stationary two-layer fluid flow with longitudinal gradient of temperature

Many applications challenge scientists with the problem of common motion of two liquid media contacting along some surface and stability of such motion. Side by side with free convection mechanism the cause of these motions is thermocapillary effect. In the present work we consider plane stationary flow of two immiscible incompressible viscous heat-conducting liquids with common interface. Having assumed that the surface tension coefficient linearly depends on temperature we investigate stability of the system on inclined plane with longitudinal temperature gradient. There is change of instability mechanisms when the system incline is varied. We have only monotonic disturbances when system has horizontal orientation. If there is any horizontal deviation the structure of spectrum is changed and oscillatory disturbances is appeared.

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One dimensional model of vertical structure of salt lake (on example of Shira Lake

Vertical density stratification has a decisive influence on the spatial and temporal distribution of chemical components and the ecology of planktonic organisms in deep lakes. In the water column of stratified water bodies are forming ecologically significant vertical gradients of temperature, light, oxygen, salinity, redox potential, nutrients and other components of the ecosystem. There are different ecological niches of planktonic microorganisms along gradients of physical and chemical characteristics. This leads to the formation of stable heterogeneous vertical distribution of various species of bacteria, phytoplankton and zooplankton. The aim of this work was to create a one-dimensional vertical model describing the annual dynamics of vertical structure of a saline lake including processes of formation and melting of ice. Mathematical models [1, 2] are used for investigation of vertical structure of a reservoir. Modification of the model [1] for the determination of the vertical distribution of hydrobiological and hydrochemical characteristics under the ice during winter was done. After definition of the thickness of convective mixing layer we solve one-dimensional transport and diffusion equations. We take into account settling for the heavy components. We use special parameterization of coefficient of vertical exchange: in the layer of convective mixing coefficient is taken sufficiently large, and below this layer is equal to the minimum value.We investigated seasonal regimes of vertical structure of Lake Shira with the help of developed computer models and field data. We showed that the thickness of the convective mixing under ice significantly depends on the meteorological data in the autumn. The different vertical distribution in different years were explained by differences of meteorological conditions.Important elements of the vertical hydrophysical structure of the saline lake are thermocline, halocline and pycnocline. There are the greatest changes in the vertical temperature, salinity and water density in these layers. These layers separate a water with homogeneous characteristics. According to field data depths of thermocline, pycnocline and halocline are the same for lake Shira. They depend on meteorological data and the period of the year. It follows from the field data that a redox zone (boundary between oxygen or hydrogen sulfide) in lake Shira coincides with pycnocline for the autumn and winter seasons. Pycnocline depth calculated by hydrophysical model is in good agreement with field data. In summer and spring redox zone is significantly lower than pycnocline. In the zone of transition from the aerobic layers of the water column to the anaerobic (redox zone) it is generally observed increased activity of plankton communities. The depth of the redox zone is an essential feature of stratified reservoir.

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An identification problems of the coefficients of the parabolic equations

In the report identification problems of unknown coefficients for the two-dimensional and multidimensional parabolic equations in case of given Cauchy data are considered. The local existence theorem and the theorem of uniqueness of the solution for a identification problem of two coefficients in classes of the smooth limited functions for the multidimensional semilinear parabolic equation with non-linearity of enough general view are proved. The case of the unknown factors standing at a nonlinear member and function of a source, and a two-dimensional case of the unknown factors standing at a derivative on time and a nonlinear member is considered. The existence and uniqueness of the solution are proved and estimations of stability by the initial data for solution of identification problems of coefficients at lower terms in the parabolic equation are obtained. The multidimensional inverse problems for the parabolic equation with the elliptic operator in the right part which coefficients depend on all spatial variables and have a special appearance in the case of enough smooth initial data are considered. For the proof of existence of the solution the weak approximation method is used. This method is a splitting method of the equation at the differential level, and was named so by N.N. Yanenko.

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Modeling of Radio Propagation in the Land-Satellite Link through the Stormtime Ionosphere

This paper presents the intensity and phase fluctuations dependence on the degree of ionospheric plasma perturbations occur during magnetic storm based on experiments by GPS monitoring of the ionosphere. During this nat-

ural phenomenon, anomalous absorption caused by decrease of the total electronic content, and fast fading of GPS radio signals caused by generation of plasma small-scale irregularities are observed experimentally. In order to present the effect of scattering caused by plasma irregularities generated during magnetic storm, 2-D phase-screen model is introduced. A satisfactory explanation of fading phenomena observed experimentally is presented based on the corresponding theoretical framework. It was found that during magnetic storm, when experimentally observed deviations of plasma density in the perturbed ionosphere can be changed at 10%-20%, the corresponding small-scale and moderate-scale plasma density irregularities in the storm-time F region yield strong fast fading of VHF/UHF radio signals with sufficient signal intensity fluctuations (up to 10%) and phase fluctuations (up to hundreds radians), which finally can significantly decrease the spectral efficiency, capacity and signal data rate in multipath land-satellite communication link with fading passing through the perturbed ionosphere.

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Mathematical model of monopoly competition

Essence of monopoly competition consists in the way that, offer and demand are being specified by only one competitor on the market. In this case, there is no chance of increasing numbers of bidders and goods which is offered on the market, could't have an own replacement. Considering this new conditions, market price is result of offer and demand operating law. Therefore, if consumers want to pay an actual price, shopping power will be shown up as limited factor for price increasing.

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Strongly Nonlinear Hyperbolic - Elliptic Problem in a Bounded Domain

We investigate a mixed hyperbolic-elliptic type system of PDEs in a given domain. Motivated by physics, we consider nonzero boundary conditions, which describe a flow through the domain. We prove the solvability of this system, using a kinetic formulation of the problem. The system can be used for different physical situations, such as: a) the motion of superconducting vortices in the superconductor; b) the Keller-Segel model, describing the collective cell movement; c) the porous media motion and etc.

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Oscillating solutions of the equation $y''+a(x)\cdot y=0$ for small values of the coefficient $a(x)$

Canonic equation (1) $y'' + a(x)\cdot y = 0$ has oscillating solutions, if the coefficient $a(x)$ is positive and the function $a(x)\cdot y$ meets the Lipschitz condition. We have determined the solutions of this equation by sequence iteration method and directly proved that they are oscillating. However, in this work we have shown that the equation (1) has oscillating solutions even when the coefficient $a(x)$ is small, $a(x) \to 0$, when $x \to +\infty$ and integral $\int\limits_{0}^{+\infty} a(x)\,dx$ diverges with $a(x)$ which can be, but it does not have to be monotonous. If $a(x)$ is not monotonous function, then all intervals of monotony of the coefficient $a(x)$ should be determined. Then in each of these intervals the number and locations of zero oscillations should be also determined.

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Properties of coefficients of analytical periodic functions

If function f (x) is analytical, then it can be presented by convergent exponential sequence which, due to its convergence (d'Alember's criterium), can be differentiated and integrated, member by member and as a rule it has Taylor's coefficients. However, in this work we have determined the properties of coefficient sequence when function is analytical, but also periodic with period ω. We have also shown that for the periodic function the coefficient sequence has the following form

$$a_k = \frac{\varphi^{(k)}(\omega)}{k!} = \frac{\varphi^{(k)}(2\omega)}{k!} = \frac{\varphi^{(k)}(n\omega)}{k!}$$

In this way we have obtained infinite number of Taylor's formulae which are valid near the points $0, 2\omega,...,n\omega$.

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Modelirannje i analiza performance proizvodnog sistema korišće-njem Petrijevih mreža i markovih lanaca

U proizvodnji postoji potreba da se na odgovarajući način koordinira i sinhro-nizuju one aktivnosti i resursii koji saglasno deluju da bi se proizvela grupa proizvoda. Ovo je problem konstrukcijske prizvodne kontrole. U ovom radu se naglašava pristup Petrijeve mreže za modeliranje, kontrolu i analizu per-formanse automatizovanih proizvodnih sistema. Problem modeliranja se karakteriše saglasnim i asihronim događajima koji su tipični za takve diskretne dinamičke sisteme. Petrijeve mreže su dobre za modeliranje prizvodnog sistema jer obuhvatju relacije i interakcije među događajima. Ovo omogućuj e kvalitativnu analizu takvih svojstava sistema kao što su prekidi , konflikti i ograničenja. Stohastičke Petrieve mreže (SPNs) su tempirane PM u kojima su vremena prelaza proizvoljne (slučajne) promenljive. Ako vremena prelaza imaju eksponencijalno raspodeljene brzine opaljivanja, onda je SPN ekviva-lentna Markovom nizu kontinualnog vremena . Što je na primeru i dokazano.

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Gradient methods of solving Ill-Posed Cauchy problem

Let Ω be a bounded simply connected domain in $R = \{(x,y)\}$ with a continu-ous piece-smooth boundary $\Gamma = \partial\Omega$. Let Γ be divided into two connected parts $\Gamma_1 \cup \Gamma_2 = \Gamma$,

$\Gamma_1 \cap \Gamma_2 = \Theta$.

Consider the following problem

$$\Delta u = 0, \quad (x,y) \in \Omega , \tag{1}$$

$$u\big|_{\Gamma_1} = f(x,y), \quad (x,y) \in \Gamma_1 , \tag{2}$$

$$\frac{\partial u}{\partial n}\bigg|_{\Gamma_1} = 0. \tag{3}$$

The problem (1)-(3) is ill-posed according to Hadamard. The solution is unique, but it is not stable with respect to a small perturbations of the func-tion f. In this connection we use the solutions of the stable boundary prob-lems for the same differential equation (1) instead of solving the ill-posed

problem (1)-(3). Such idea was proposed by Kabanikhin S.I. and Karchevskiy A. L. [1], and developed in [2].

As a well-posed problem for (1)-(3), for instance, the Neumann problem for the initial Laplace equation in the domain Ω may be used, which requires knowledge of boundary values of a normal derivative of the solution on the whole boundary. Though according to the condition (3), we are only given boundary conditions on a part of the boundary. That is why it is necessary to associate boundary values of the initial function f with the boundary values of the normal derivative of the solution on the additional part of the boundary that is quite a distinct problem.

Researching properties of the operator connecting f with the above mentioned boundary values of the normal derivative of the solution and its conjugate operator, allows to use variational method to look for an approximate solution of the initial problem (1)-(3).

Analogous approach for other problems may be found in [2].

In this paper justification of the use of the conjugate gradient method is given for solving the problem (1)-(.3) and its convergence.

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Iterative algorithms for the decision of the net Navier-Stoks equations

In work are developed and mathematically two iterative schemes based on idea of «weak compressibility» are proved, is thus shown that speed of convergence of the offered iterative schemes do not depend on quantity of knots finally-differential schemes, i.e. uniform convergence of iteration is reached.

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ON LOCATION OF ZEROS OF SECOND ORDER COMPLEX DIFFERENTIAL EQUATIONS

(Comparison of R. Nevanlinna's method of assessment of solutions number with classical theorem on location of Sturm's zeros of real differential equations)

For second order real differential equation

$$y'' + A(x)y = 0 \tag{1}$$

in, so called, period of Sturm, form 1806 to 1826, the first qualitative theorems on numbers of zero solutions $y(x)$ in dependence of $A(x)$ and $[a,b]$ positive interval where $A(x) > 0$, have been established. At that time the concept of iteration were not known enough (it has been strictly introduced in 1860.), so at that time the location of zeros could not be precisely determined, according to Sturm.

Later, the appearance of group theory on differential equation enabled an exact approach to location of zero oscillation. However, this has not been the best solution since the oscillations are the fundamental natural phenomena related to the Newton's law, while the method based on group theory was too difficult for such an elementary issue. So, the problem of location of zeros, and of courses the number of zeros, remain unsolved until the time and forthcoming wave of new mathematics did not push this issue at the corner of mathematical science.

Recently, we are going back to the problem of zeros of Sturm's equation (1), and naturally we are looking for analogy to Sturm's zeros of real differential equation (1), if we are observing the complex differential equation of oscillation

$$\frac{d^2w}{dz^2} + A(z)w = 0 \tag{2}$$

which is corresponding to (1) only for $z = x + iy = x$, $y = 0$. Of course that (2) does not have to be an equation of some oscillation (that is certain only for $z = x + iy$, $y = 0$ and $A(x) > 0$), and (2) is also called complex differential equation of oscillations. Due to historical continuity the equation (2) can have several possibilities of solution varieties.

This paper will show various ways of bringing down the equation (2) to the system of second order partial equations, and than to one simple differential equation of order IV that further could be brought down to the two simple second order equation of Sturm, given by (1).

Therefore, the question is relation between two milestones in the

qualitative theory of differential equations:
- Sturm's theorem on the number of zeros
- Nevanlinna's theorem on assessment of growth and rang.

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Mathematical models and application of numerical methods in solving a phenomenon of the theory of thin plates

The term thin plate implied a elastic body with cylindrical or prismatic shape of small thicknes in relation to other two dimensions. The basic dependences between geometrical and physical properties come to mostly to setting up of relations between stress and strain conditions, which has been described by differential equations, simple and partial. Methods used for solving of established equations, with respect of outline and initial conditions, may be classified in analytical and numerical. In case of complex and big construction systems subjected to the arbitrary loads, including a complex boundary condition s, solving of differential equations by analytical methods is almost impossible. Then the solution is application of numerical methods. One of the basic numerical methods is Finite Difference Method (FDM) based on replacing of differential equations with corresponding difference equations. Using of this method, the problem come to solving of system of paired algebraic equations, making the problem more easier for solving. In this paper, besides FDM, is also used Finite Element Method (FEM) for consideration of this phenomenon in flat isotropic field, respectively at thin plates with different boundary conditions and loadings. In the end, more comments and farther directions of investigations are given.

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About a properties of divergent closed trajectories

Some properties of closed divergent trajectories , divergent limit cycles as well as some corrections of "О некоторых свойствах дивергентных предельных циклов», written by V. V. Amelkin have been presented in this paper.

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Information resource intergation problems

The given report to development of the technology buildings of the distributed integrable systems of the processing, keeping and issues information resource on base opened specification of the models data.

The model of "virtual environment for interchange of the results of scientific researches" would be discussed – the enterprise or regional information system, which integrates the systems for scientific research and organizing activity. Its distinctive feature are: complex support of scientific activity, orientation at various categories of users such as graduates, researchers, managers, secretaries, etc.

The researches that generalize applying of introduced technology for using at regional-scaled applications was done. Functioning to intellectual informational systems in terms of informatics was described, the needs for information of scientific society explored.

Technological approach for exchanging catalogized data and integrating informational systems was tested while creating new and modifying existing systems for storing and exchanging bibliographical records. Another important result is creating of unified informational space for researching in environmental science.

Models, procedures and interfaces of registration the politician of the control of access in a control system of access to the distributed information resources (CSADIR) are developed. Completion created before prototype CSADIR for research of model of the distributed management by access is in addition spent. Thus, conditions for transition to performance of a following stage of works under the project pre-production operation of the test monitoring system of access to resources and the analysis of this operation will be which primary goal are created.

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The nonlinear dispersive equations of shallow water on a rotating sphere

In the paper the nonlinear dispersive equations of a shallow water on a rotating sphere are derived. The received equations are completely nonlinear. The opportunity of a moveable bottom surface is taken into account. The new model will be useful to the description of long waves (tsunami) over vast latitudinal and longitudinal directions of water areas during long time.

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Information-Theoretic Methods for Solving Steganography Problem

Сегодня в сфере защиты информации велик интерес к проблемам *стеганографии*, т.е. (говоря упрощённо) методам внедрения скрытой информации в файлы, и *стегоанализу*, т.е. методам выявления скрытой информации. Оба эти направления развиваются параллельно и взаимно обогащают друг друга. Несмотря на достигнутый прогресс, всё еще остаётся большое поле для исследований как путей повышения стойкости стегосистем, так и увеличения разрешающей способности методов стегоанализа. В настоящем докладе представлены результаты, полученные авторами в течение нескольких последних лет совместно с их аспирантами и магистрантами на основе применения идей и методов теории информации, прежде всего, универсального кодирования источников. Ранее эти идеи с успехом были применены для построения просто реализуемых идеальных шифров, а также для криптоанализа генераторов псевдослучайных последовательностей и блоковых шифров, см. [1].

Рассмотрим вначале суть теоретико-информационного подхода к задачам стеганографии. В одной из первых работ в этой области [2] было введено понятие *совершенной* стегосистемы, т.е. такой системы внедрения данных, для которой в принципе не возможно создать алгоритм выявления факта наличия скрытой информации. При построении совершенной стегосистемы контейнер рассматривается как сообщение, порождённое вероятностным источником, а (зашифрованные) данные, которые необходимо внедрить − как последовательность равновероятных и независимых нулей и единиц. Необходимо так внедрить данные, чтобы вероятностная структура контейнера осталась той же самой. Тогда заполненный контейнер становится сообщением того же источника, что и пустой, поэтому невозможно сказать, присутствует скрытая информация или нет. Впервые конструкция совершенной стегосистемы для источников конечной памяти с неизвестной статистикой была предложена в [3]. Эта конструкция основывается на идеях нумерационного кодирования и в простейшем случае может быть пояснена следующим примером. Рассмотрим источник без памяти над алфавитом $\{a,b\}$. Допустим, источник породил сообщение *aaba*. Мы не знаем вероятности появления этого сообщения, однако с уверенностью можем сказать, что она та же самая, что и для сообщений *baaa*, *abaa* и *aaab*, т.к. они содержат одинаковое число букв a и b. Все эти четыре сообщения принадлежат одному классу эквивалентности − классу равновероятных сообщений для данного источника. Теперь мы можем скрыть два бита информации, используя отображение $00 \rightarrow aaab$, $01 \rightarrow aaba$, $10 \rightarrow abaa$, $11 \rightarrow baaa$. Как видим, скрываемая информация − это просто номер в лексикографически упо-

рядоченном множестве равновероятных сообщений. Таким образом, чтобы скрыть информацию, нужно решить задачу *денумерации* для заданного сообщения и типа источника. Извлечение скрытой информации выполняется путём определения номера сообщения, т.е. решения задачи *нумерации*. Авторами построены эффективные методы нумерации и денумерации для широкого класса источников, включая марковские источники произвольного порядка.

Не все контейнеры, используемые в практической стеганографии, например, цифровые фотографии, можно точно описать некоторым случайным процессом. Однако построение приближённой вероятностной модели этих контейнеров часто оказывается полезным. Такая вероятностная модель (явная или неявная) строится, например, при сжатии графических файлов. Мы предлагаем использовать вероятностные модели для решения задач стеганографии. В этом случае внедряемое сообщение перекодируется таким образом, чтобы кодовые символы подчинялись тем же распределениям вероятностей, что и заменяемые ими символы в контейнере. Быстрые методы кодирования, обеспечивающие в точности заданные вероятности появления кодовых символов, предложены в [4]. Иногда целесообразно использовать методы, приближённо решающие эту задачу, например, арифметическое декодирование. Нами построен алгоритм внедрения информации в растровые изображения, учитывающий статистику младших бит цветовых составляющих в некотором окружающем контексте. Экспериментальные исследования алгоритма показали его заметное преимущество в стойкости по отношению к известным аналогам: увеличение стойкости на 15–40 % на случайной выборке файлов и на 95 % на «удобных» файлах (с плавными переходами цветов) по отношению к известным программам HIDE4PGP и STEGOTOOLS.

Применение идей теории информации для решения задач стегоанализа основывается на теоретическом фундаменте, построенном в [5, 6]. В этих работах было показано, как можно использовать методы универсального кодирования для эффективного решения многих задач математической статистики. Для стегоанализа графических файлов, в частности, важно уметь решать задачу выявления степени статистической зависимости младших бит цветовых составляющих или частотных коэффициентов от остальной информации в файле. Дело в том, что при внедрении информации эта статистическая связь искажается или теряется вовсе. Наиболее успешная практическая реализация этих идей была выполнена при построении системы стегоанализа BMP-файлов [7], а затем и JPEG-файлов. Основная идея состоит в сравнении степеней сжатия полученного файла и этого же файла с различным уровнем внедрения в него случайных данных. Если разность степеней сжатия превышает некоторый порог, делается вывод о наличии в полученном файле скры-

той информации. В результате экспериментальных исследований на выборке из 1000 файлов было установлено, что ошибка первого рода (пустой контейнер принимается как заполненный) не превосходит 1 %. При уровне внедрения информации 40 % и выше ошибка второго рода (заполненный контейнер признаётся пустым) не превосходит 2 %. Совокупность этих показателей лучше, чем у известных методов, таких как STEGDETECT.

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A fixed point theorem for mappings with a concractive iterate at a point on D*-metric spaces

The concept of D* -metric space introduced by S. Sedghi et al. seems to be more appropriate in fixed point theory then S. Gahler and B. C. Dhage definitions of distance for three (or more) points. In this paper I am going to prove a fixed point theorem for self-mappings with contractive iterate at a point on closed subset of D*-metric space. At the end a common fixed point theorem for sequence of self-mappings on D*-metric space will be proved. Let us recall that function T X: $\rightarrow$X with property: for any x in X there exists n=n(x) in N such that any y,z in X D*(Tnx,Tny,Tnz) $\leq$ qD*(x,y,z) , q in [0,1), we say that T has a contractive iterate at a point.

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Numerical simulation of unsteady cavitating flow over hydrofoil

Modeling of the cavitating turbulent flow over hydrofoil NACA6602-12% in 2D statement at various angles of attack and cavitating numbers has been carried out. Modeling of cavitating turbulent flow is carried out within the framework of homogeneous approximation for the two-phase medium. For the purpose of vapor phase transfer description a number of models approved for the problems of cavitating flow around streamline bodies (blades, hydrofoils) is chosen. Two-phase turbulent flow modeling is based on the non-stationary formulation of the RANS approach. For the closure of Reynolds averaged equations dissipative models of turbulence are used: modified high-Reynolds k-epsilon model and two-layer k-omega Menter model. Basing on the operator-splitting techniques for non-steady form of continuity and flow equation, there is proposed the scheme of the Douglas-Rachford type for problems with strong coupling between pressure and density fields. The numerical implementation of this scheme is performed as a predictor-corrector procedure similar to SIMPLEC algorithm. The simulation of flows over a number of axisymmetric cylindrical bodies and a planar hydrofoil at various cavitation numbers has been performed for the purpose of cavitation models and numerical methods verification. The numerical modeling of the cavitating turbulent flow over the hydrofoil has predicted a development of the self-oscillating mode. On the rear side of hydrofoil near to a head part the vapor cavity is formed. In the tail of cavity the re-entrant jet is observed, resulting in the separation of vapor cavities and development of the bubbly flow mode. The obtained numerical results are compared to available experimental data for the pressure field distribution, Strouhal number and the maximal length of the attached vapor cavity.

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On certain statements of inverse problems in mechanics of composite plates and shells and methods of a solution thereof

Тонкостенные изделия типа пластин и оболочек являются важнейшими элементами многих современных конструкций атомной энергетики, авиационной, космической и машиностроительной техники, глубоководных аппаратов, строительной индустрии.
При анализе работоспособности и надежности таких конструкций, их

экономической эффективности первостепенное значение имеют расчеты их прочности, жесткости, обеспечения минимального веса и стоимости. Высокие удельные прочностные характеристики традиционных материалов (сталей, алюминиевых, магниевых и титановых сплавов) достигли своего предела и возможности их дальнейшего прогресса невелики. Значительное повышение требований к современным конструкциям, заставило использовать при их изготовлении новые композиционные материалы. Принцип армирования высокопрочными и высокомодульными волокнами открыл пути к практически неограниченному совершенствованию современных композитных конструкций, сочетающих высокие показатели прочности, жесткости, надежности с другими ценными качествами: относительно малым весом, регулируемыми свойствами электро и теплопроводности, высокой стойкостью к агрессивным средам и т.п.

В работе рассматриваются некоторые новые постановки обратных задач механики тонкостенных однородных, слоистых и армированных пластин и оболочек. Обсуждаются возможные критерии рационального и оптимального проектирования однородных и гибридных конструкций. Представлен оригинальный метод решения широкого класса задач рационального проектирования композитных конструкций. Исследован ряд конкретных задач рационального проектирования армированных оболочек, когда в качестве критериев рациональности выступают требования безмоментности и безызгибности напряженно-деформированного состояния, равнонапряженности арматуры, постоянства удельной потенциальной энергии оболочки.

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Numerical Aspects of Adaptive Harmonic Balance Method in Circuit Simulation

The Harmonic Balance (HB) is the powerful and efficient method of steady-state analysis in many practical simulation problems in particular in nonlinear automatic control systems, in electrical simulation and others. HB is the frequency-domain technique of nonlinear simulation and it has well known advantages in comparison with time-domain steady-state simulation. In particular, applying to simulation of nonlinear radio frequency (RF) circuits it finds solutions efficiently for problems with widely separated time constants and also with multitone excitation. However, though the conventional HB method is well suited for weakly and mildly nonlinear problems it has essential limitations for analysis of strong nonlinear circuits. Actually the each variable is

presented by a truncated Fourier series, resulting in a system of equations of order ORD=(2K+1)N, where K is the number of terms in the Fourier series (harmonics) and N is the number of state variables in the analyzed circuit. To obtain desired accuracy highly nonlinear problems require a large number of harmonics, which may increase the size of the system to be solved beyond practical limits. Therefore the problem of solving of large dimension system is the key computational problem of the HB technique. New techniques are required to extend the Harmonic Balance method for solving strong nonlinear problems. New computational approach - Adaptive HB Analysis (AHBA-approach) is discussed. The approach is based on adjusting the order of HB problems by adaptation to nonlinearity degree. The suggested adaptive harmonic balance analysis is intended to reduce computational efforts for HB large problems during simulation process due to automatic varying number of harmonics. The main purposes of AHBA approach are the following: - develop computational schemes that support reducing HB problems by adaptation to nonlinearity degree; - reduce computational efforts for solving large dimension HB problems with large number of relatively small entries. The developed computational procedures are based on Krylov subspace techniques.

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Analytical design of linear regulator on singular perturbations

In article is considered stationary singularly pertubed operating system. Offered the way of designing of linear regulator based on method of motion separation and characteristics of Grama operator. The results were obtained:

- controlling, which provides passing the system from initial state to the final state, possesses the decomposition, and it can be determined in different scales of time by vectors, which belongs to the area of values corresponding to inverse operators Grama;
- matrixes-operator Grama - an symmetric and depending on time of moving the prepared subsystems, have the different scales of integration area;
- for operated stationary system with slow and quick motion is constructed the linear regulator, consisting of two sub regulators, which provide the translation of system from any point in space to the origin of coordinate system moreover under their action are apart adjusted (on rate of action depending on time) different phase motion of the system

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Numerical analysis of electric arc by the relaxation method

In this work a mathematical model is proposed, in the basis of which there is a total nonstationary system of magnetogasdynamic equations. Production of the steady-state condition of gas flow and gas heating with electric arc in a channel by the relaxation /pseudoviscosity method is investigated. This model and the developed algorithm and program of calculation may be used for studies of nonstationary processes related to connection and interruption of arcs, transient processes and use of alternating current sources. Besides, this computation method allows to study stability of stationary solution produced by the relaxation method.

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Numerical modeling of interaction of solid particles with a gas flow

In the present work the injection of two-phase gas-dispersed flows (air-solid particles) are simulated. For the solution of the problem the Euler-Lagrange approaches is used. The mechanism of an interchange of gases with particles is studied.

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Parallel Solution of Shallow Water Equations by the Lattice Boltzmann Method

INTRODUCTION
The lattice Boltzmann method (LBM) is a relatively new and promising numerical technique for simulating a broad variety of complex physical systems, especially fluid flows [1-4]. Having arisen about twenty years ago, the LBM is becoming a serious alternative to traditional numerical methods, such as finite-difference/volume/ element schemes. In this report the lattice Boltzmann method is applied for two-dimensional shallow water equations (SWE) describing tidal flows in seas and oceans. The exact kind of the SWE is presented in [5] where this equations have been solved by the finite element method. The technique of using the LBM for the SWE is presented for the first time in [3]. Here, unlike [3], we consider another type of shallow water equa-

tions and also a parallel implementation is shown. Some tests of the parallel code, performed on the cluster MVS-100K (about 8000 CPU, 95 Tflops), have given satisfactory results

LATTICE BOLTZMANN METHOD

|The basic idea of the LBM is to use a simplified kinetic Boltzmann equation of a gas which is nevertheless capable on the macroscopic level to give correct average values for velocity, density, pressure and for other characteristics of fluid flows. Unlike the traditional methods, based on discretizations of continuum conservation equations (mass, momentum, energy), the LBM models the fluid consisting of fictive mesoscopic particles, and such particles perform consecutive "free flight" and collision processes over a discrete lattice grid. So, the lattice Boltzmann model is based on the statistical physics and describes the microscopic behavior of particles in a very simplified manner, but it correctly describe the macroscopic flow behavior. The main advantages of the LBM are that: (1) initial equations have a simple form; there are derivatives only of the first order; the convection operator is linear; nonlinearity is present only in an algebraic source term; (2) in view of local character of calculations (only nearby particles interact with each other), the LB-method is easily realised on parallel computers; (3) the pressure is calculated using the equation of state; there is no necessity to solve the Poisson equation in all domain; (4) it is a convenient and perspective tool for modeling of physical and chemical processes in geometrically complex areas of micro and nano sizes (porous media and nano-structures); (5) easy of incorporating microscopic interactions and boundary conditions; (6) simplicity of programming.

PARALLELIZATION USING DVM-SYSTEM

A parallel version of the LBM for the shallow water equations has been implemented in this work using the Fortran-DVM language developed in the Keldysh Institute of Applied Mathematics of RAS [6-7]. The main goals of Fortran-DVM are follows [7]. Simplicity of parallel program development. Portability of parallel program onto different architecture computers (serial and parallel). For serial computers the portability is provided by DVM-directive "transparency" for standard Fortran 77 compilers. High performance of program execution. Unified parallelism model for Fortran 77 languages, and, as result, unified system of runtime support, debugging, performance analyzing and prediction. Domain decomposition has been performed to parallelize the lattice Boltzmann method. In the recent years the Fortran-DVM/OpenMP language also has been developed in the Keldysh Institute. It allows essentially to automate a programming of SMP-clusters which are using multiprocessors.

NUMERICAL EXPERIMENTS

To verify the code, we solve some benchmark tasks. The numerical results are compared with either analytical solutions or numerical results reported in the literature. The first test is so called "tidal wave flow" [3]. This is 1-D prob-

lem with bed profile prescribed exactly. The analytical solution of this task is given in [8]. Other test concerns distributions of surface waves in 2-D square area. At initial moment the "bulb" is set at the centre of area. Solutions of this problem by the LBM and FEM [5] are compared.

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Research of efficiency of parallel realization of FEM for boundary problem of shallow water equations

In this work efficiency of some parallel realizations of an algorithm for the numerical solution of a boundary-value problem for the shallow water equations which were performed with the help of the MPI library for C language is compared. The first approach is based on the decomposition of a computational domain without overlapping subdomains, the second approach is based on the decomposition with shady sides. Theoretical estimates of acceleration for the parallel algorithm are given. Numerical results for a model grid and nonstructured grid for the Okhotsk sea are presented. Results concerning acceleration of computations depending on the number of processes, the type of communication realization, and the method of the decomposition of a computational domain are presented.

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Generalized Cauchy problem for the description of complicated gas flow with shock waves

A study of the flows with singularities, including shock waves, is on the modern problems of gas dynamics. Mathematical description of such flows one can transform to generalized Cauchy problem (GKP) for the system of PDEs. A difference in the GKP from the Cauchy problem in traditional setting lies in fact that initial (boundary) conditions are given not on one, but on two or on various surfaces. The number of surfaces does not exceed the number of independent variables. The number of conditions coincides with the number unknown functions. Existence and uniqueness theorems of GKP in a class of analytic functions are proved. The proved theorems are used for mathematical description of various gas flows with shock waves.

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Some analytical solution of nonlinear poisson equation for inversion layer of mos structure

In this paper, some analytical solutions of the nonlinear Poisson equation for inversion layer of MOS structure are presented. These solutions are based on smoothing functions and parameters than on physical approximate expressions available in the weak and strong inversion. On this way an explicit surface potential versus gate voltage relations in the case of strong inversion in semiconductor are derived. Comparison with numerical data shows that the solution gives good approximations of potential for MOS structure. These solutions can be applied to estimate classical and quantum mechanical density of carriers of nanoscale MOSFETs.

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Entry and exit of an elastic shell on a thin layer of the water

The paper is concerned with a problem of elastic shell fall down onto a thin layer of an ideal incompressible liquid. The shell initially touches the liquid free surface at a single point and then penetrates the liquid layer. The problem is coupled because the liquid flow, the shape of the elastic shell and the

geometry of the contact region between the body and the liquid must be determined simultaneously. The 2D-problem of a circular cylindrical shell impact and axisymmetrical case were considered before by the method of matched asymptotic expansions for analyzes of liquid flow. This method was developed by Korobkin (1995) for the case of the flat rigid body penetrate onto a the thin layer of the liquid. The structural analysis is based on the normal-mode method. Strain-time histories of the inner surface of the spherical shell are of particular interest. At the present study velocity of the interaction is small and effects of gravity taken into account. It is allow us to considered not only exit, but also exit of shell from the water layer under the buoyancy forces.

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Information technology for the geodynamic risks estimation

Research is directed on satisfaction of increasing volumes of building in difficult geodynamic conditions, taking into account development of the market of the real estate, for the purpose of decrease in geodynamic risks, with reference to territory of Krasnoyarsk region. As a result of researches the information technology which components are the analysis of the data of geomonitoring about adverse geodynamic factors, settlement modules of an estimation сотрясаемости грунтов, and also the account of geodynamic risk at a cadastral both market estimation of the ground areas and real estate insurance is developed. Working out of the GIS-SCHEME of division into districts of Krasnoyarsk on degree of geodynamic danger, razlomno-blokovomu to a structure and neotectonic movements is carried out by carrying out of tool geophysical researches. Bases of records axelerogramms, which allows to create the rynochno-attractive information for the building companies are created. Points of supervision of geomonitoring have been placed on profiles from known pointed zones Altai Sayansk seismoactive area in a direction to Krasnoyarsk for reception axelerogramms and characteristics of attenuation of seismic fluctuations with distance. Within the limits of the specified researches it is developed information-methodical maintenance for the account of geodynamic factors at a cadastral both market estimation of the ground areas and real estate insurance.

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Spline wavelet decomposition and parallel compression

Splines and wavelets are extensively applied to designing efficient algorithms for processing of digital data flows. If spline spaces on a refining sequence of grids are embedded in each other, the chain of embedded spaces decomposes into a direct sum of wavelet spaces, and basis functions with minimum support length are given, then a wavelet decomposition of the corresponding data flow can be constructed, which substantially reduces computational expenditures. Moreover, by using non-uniform grids, it is possible to improve approximation without complicating computations. Thus, we can split the initial data flow so as to distinguish main and refining data flows. This allows us to compress the input digital signal and transmit the main data flow at higher speed; the refining flow can be transmitted only fragmentarily, depending on needs. We regard spline wavelet decomposition of B-spline spaces for arbitrary refining of non-uniform grids. Thus a new algorithm for compression (decomposition formulas) and decompression (reconstruction formulas) of digital data flows is developed. Numerical simulation results of compression of model digital data flows are done. Multiprocessor systems or multicore processors give the best fit to spline wavelet splitting of digital flows: every flow processing can appoint to one of processors (cores). Even two cores appreciably increase compressing and decompressing of digital signals. Parallel forms of decomposition and reconstruction formulas are done.

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Algorithm of stochastic approximation of set of attainability for controlled system on plane

Algorithm of the internal approximations construction for the attainability set of controlled system with parallelepiped limitations for two-dimensional systems Is considered. Algorithm is based on the method of stochastic approximation, which includes the generation procedure of the collection of functions, which can cover sufficiently tightly the set of admissible controls, and integration method of system under selected control. As the class of approximating controls, the random relay functions with random number of

switching are used. To investigate the properties of proposed algorithm, the collection of test problems is developed. Carried out comparisons with results of other authors confirm the fitness for work of proposed method. We give some results of computational experiments.

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Geogebra and high school analytic geometry instruction

All modern versions of educational software simply attract high school teachers as well as their students to apply them in the process of teaching/learning mathematics. GeoGebra offers extraordinary high possibilities to modernize the process of teaching/learning analytic geometry in high schools. Nevertheless, how efficient is such a process? How much effort should teachers and students invest in the process to combine GeoGebra and mathematics in a meaningful manner? Does such an effort pay off? In this article we try to answer these and other similar questions. Our source of information was an experimental instruction we held in technical school "Nikola Tesla" in Leposavić, Serbia. Results of earlier researches in this field (dr. Dragoslav Herceg, 2003 – 2008 dr. Radivoje Stojković, 2003 – 2006) were used while organizing and carrying out the instruction process. GeoGebra was embedded in the analytic geometry instruction using appropriate dynamic worksheets. There are shown in the article some of the worksheets used as well as possible ways to organize and perform such a process of teaching/ learning, ways to organize an appropriate classroom and advantages and disadvantages of the process.

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Deformation of plates from alloys with different properties on tension and compression at creep

The results of calculations received by using various techniques in one- and twodimensional statements for a problem of torsion of a square plate at the high temperature with taking into account different resistance of a material to tension and compression at creep are submitted. Kinematic and static statements of a problem are considered also. Calculation for materials with

different resistance at creep by using the standard finite-elements packages is problematic enough, but such programs can be used for an estimation of the received decisions. Comparison of numerical results and experimental data of curvature of a plate for two aluminium alloys is executed. It is shown not taking into account of real properties of creep at the decision of applied problems of details shaping and forecasting of their further exploitation can result in essential mistakes which can reach one order and more.

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Adaptive technology for the numerical solution of the optimal control problems with the computational peculiarities

В докладе рассмотрен класс задач оптимального управления с вычислительными особенностями, описаны подходы, позволяющие успешно находить оптимальные решения. В целях автоматизации процесса решения таких задач разработан интеллектуальный динамический планировщик - компонент программного комплекса, имитирующий действия эксперта при работе с программным комплексом в диалоговом режиме. Представлена формальная модель эксперта, на основании которой разработан планировщик, приведена архитектура программного комплекса, учитывающая возможность решения задач рассматриваемого класса. Работоспособность разработанного программного комплекса проверена на пакете тестовых задач и ряде модельных прикладных задач из области биохимии и аэродинамики.

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On construction weighted projective plane of order 4 and (2, 4 − 1)-quasigroup

We introduce a notion of weighted projective planes which is a generalization of usual projective planes. We prove that a Frobenius group G of order 10 operates on a projective plane P of order 4 as a colineation group. Using this operation the plane P may be constructed. A weighted projective plane P' of order 4 is equivalent to a totally symmetric (2, 4 − 2)-quasigroup.

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Multispectral satellite data correction and preprocessing techniques for simulating of geological and landscape conditions

Despite great achievements in Earth remote sensing techniques so far visual image interpretation based on knowledge of decoding indications of considering objects is applying most of time then using multispectral data for geological purposes. Recognition of rock types on multispectral satellites images of cross-country areas and areas with presence of vegetation is difficult. Attempt of integrated solution of research of natural rock outcropping components specificity in spectral characteristic of satellite images including influence of landscape and vegetation is undertaken in presented article. Different methods of satellite images topographic correction are analyzed in the proceeding. Such as methods to minimize influence effect of variable illumination of surface in visible and infrared spectral bands. And also were analyzed different techniques for suppression of vegetative spectral contribution in areas with partial growth. Verification and evaluation of satellite data spectral correction results was done by example of test polygons with different typical landscapes with consideration of field data: assessment of vegetation fill, grain composition, contents of forming minerals in rocks, illumination. It was found that vegetation type and illumination range (for regions with compound relief) impact on reflectance of rocks more than their grain and mineral composition. Technique of shadow suppression on satellite pictures may be used for studies of different landscape properties: spectral and visual assessment of vegetation properties located on low illuminated mountainsides and modeling of landscape parts contributions (vegetation, underlying surface, illumination). Topographic correction is promising with respect to resolving of geological problems: satellite images classification for geological subjects in mountain areas where identical rocks may have different reflectance because of illumination differences; hidden tectonic structures recognitions without demonstration in relief.

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Numerical simulation of shock wave diffraction on the body as the test for time accuracy of explisit algorithm

At calculations of stationary or slowly varying flow near a flying body the main attention gives to increase the accuracy of the decision on spatial co-

ordinates. Sometimes large time step is used for achieving of stationary decision. The other situation appears for numerical simulation of essentially non-stationary processes. So for diffraction of a shock wave on a flying body, there is the impulse of displacing forces generating non-stationary forward and rotary movement of a body. Change of a trajectory, a direction of movement and speed in turn change value and the direction and value of influence to a body. There is a problem with a feedback. For such problems the error of calculation on time coordinate is integrated at calculation of integral characteristics of flow, first of all works of displacing forces and, in consequence of it, sizes of displacement, a direction of movement or a turn of a body. As the result absolutely different decisions can be received, depending on time accuracy of algorithm. Diffraction of a shock wave on the free and fixed sphere in a shock tube was numerically simulated. Two similar numerical algorithms were used: TVD schemes of Harten and Chakravarty. In the first case the second order of approximation on time in a multidimensional case was reached by splitting of the operator of a step on symmetric sequence of operators of a step in coordinate directions. In the second case time approximation of Runge-Cutta of different orders of accuracy was used. Calculations were made on sequence of structured elliptic grads. Points of grid where condensed on the surface of sphere. The algorithm of grid construction is based on the decision of system of Poisson equations. Results of calculations show essential change of integral characteristics of flow with increasing of decision accuracy.

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Interation of the distributed information resourses for the power engineering research

Energy Systems Institute named Melentiev L.A. of SB RAS carry out researches of energy systems and fuel and energy complex (FEC). These researches are associated and have common information base. For the receiving of valid conclusions and recommendations prepared for the outside organizations was proposed virtual integration of separate data bases and knowledge bases. Knowledge bases are realized as ontology space joining some ontology's of energy applied fields. Integration is made in the bounds of information infrastructure included into IT-infrastructure of power engineering research. In information infrastructure picked out three stratums: the first stratum is metadata model of information infrastructure, the second is metadata stratum and the third is data stratum of IT-infrastructure. For the making of meta-

data model are used ontology's. The objects of IT-infrastructure are described by metadata on the base of creating ontology. The program components of information infrastructure are divided on three logical levels: file system level, DBMS level and client level. In information infrastructure there are system and applied components. System components are Program core, Metadata base, File store, Administrative program and Repository driver. Applied components are Data retrieval program, File retrieval program, Web-application for the revision of Repository, SOAP-interface and others. The realization of all program components of information infrastructure made accordance with SOA conception. The central component is Repository which was realized on the base of DBMS Firebird 1.5.2 and Microsoft SQL Server 2000/2005.

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Numerical modeling of a stremnilining two bodies in tandem in the air flow

Численно моделируется процесс образования и взаимодействия вихрей при обтекании потоком воздуха двух тел, расположенных тандемом. Исследовано влияния расстояний между препятствиями на вихреобразование. Определены расстояния между препятствиями, при которых происходит интерференция завихренности (эффект резонанса).

Maximov V.V., St. Petersburg State University of Technology and Design, St. Petersburg
Nudner I.S., Research Centre for Capital Construction, St. Petersburg

The interaction of gravity waves with the partially permeable obstacles

The interaction of surface waves with the maritime works having permeable members is considered. The waves of relatively small height are studied. The liquid is ideal and incompressible, and its motion has the potential function. The theoretical problem is solved by the eigenfunction expansion method. The solution is compared with the experimental data. The analysis shows the satisfactory agreement.

Mestrovic R., Faculty of Maritime Studies, Kotor

Pavicevic Z., Faculty of Science and Mathematics, Podgorica

Topologies on the Privalov spaces with applications in the theory of Banach algebras

We compare different topologies on the Privalov spaces of analytic functions on the open unit disk in the complex plane. As an apllication, we obtain the asymptotic versions of some known theorems in the Theory of Banach Algebras.

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Mijajlovic Z., Faculty of Science and Mathematics, Beograd

Application of information science in digitization of scientific and cultural heritage

The aim of this paper is to present the efforts in the area of digitization done by a group of Serbian scientists from the Faculty of Mathematics of the University of Belgrade, the Mathematical institute and the Archeological institute of the Serbian Academy of Science and Art and since recently the Faculty of natural sciences of the University in Pristina, now situated in Kosovska Mitrovica. Goals are development of standards for digitization, development of metadata, development of computer technologies, software and database specific for digitization and scientific research of theoretical disciplines on which digitization is founded. Our achievements include the Virtual library (http://elib.matf.bg.ac.yu:8080/virlib) which includes several hundred old and rare books in mathematical sciences written by Serbian authors and most of doctoral dissertations in mathematics, astronomy and mechanics written at the Belgrade University. There is also the e-library of Serbian mathematical journals (http://elib.mi.sanu.ac.rs) which contains, for example, the complete digitized collection (since 1932) of the leading and oldest Serbian mathematical journal Publications de l'Institut Mathématique. These two projects are oriented towards Digital mathematical library, a world project on which works many world institutions. The final aim of this project is the fulfillment of a mathematical dream of a digital archive containing all peer-reviewed mathematical literature ever published, properly linked and validated (verified). Finally we mention the Electronic catalog of cultural monuments in Serbia http://spomenicikulture.mi.sanu.ac.yu. It includes various data, including GIS data, on more than 1000 most important monuments in Serbia (monasteries, archeological sites, historical sites etc).

··········· MIT 2009 ··············

Milosavljevic S., Faculty of Economics, Kosovska Mitrovica
Trajkovic S., Faculty of Science and Mathematics, Kosovska Mitrovica

M-commerce i savremene telekomunikacione tehnologije

Mobile telecommunications is a link that connects people anywhere to be found. Voice and data over the mobile telecommunication network enables the sending of information and perform transactions on a new and unique way. They create a new business domain called mobile business or m-commerce, which is an expanded foundation of Internet e-business with many unique features built. As a basic platform, mobile telecommunication networks play a crucial role in the mobile business today. Technical characteristics of mobile telecommunications and their development is determined by the base for mobile business. In this paper we study and present the technical characteristics of mobile telecommunication technology of 1g network to 3G and beyond.

Milosevic H.M., Faculty of Science and Mathematics, Kosovska Mitrovica

Application of low-temperature plasma in steel-making converters

With the use of numerical modeling an investigation of the process of the jet gunniting of the walls of a steel-making converter is considered. By the jet gunniting is meant the process of making an additional protective refractory coating on the basic lining of the walls of the steel-making converter with the aid of a system of two-phase jets transporting a softened refractory material (magnesite) to the converter wall. The results of numerical modeling agree quite satisfactorily with the experimental results in terms that the highest penetration rate of particles takes place in the region of high temperatures near the nozzle block axis into which the particles migrate under the action of turbulent fluctuations of the carrying gas flow.

Milovanovic G., College of Computer Science, Beograd

Numerical treatment of Fredholm integral equations

In this lecture we introduce and discuss some numerical methods, based on new results of polynomial approximation, for solving Fredholm integral equations of the second kind in the spaces of continuous functions equipped with

certain uniform weighted norms, where is the unknown function, and are given functions, is a weight function, and is a finite interval or the real semi-axis . Also, we mention some results for the Cauchy singular integral equations. The case we treat with the Jacobi weight and the case on half-line with the generalized Laguerre weight Assuming the continuity of the kernel we use Nyström methods and prove the stability, the convergence and the well-conditioning of the corresponding matrices. Error estimates and numerical tests are also included.

..........MIT 2009 ....

Milovanovic G., Faculty of Electronic Engineering, Nis
Spalevic M. M., Faculty of Science, Kragujevac
Paunovic Lj., Teacher-training Faculty, Leposavic

Error bounds of Gauss-Turán-Kronrod quadratures with Gori-Micchelli weight functions for analytic functions

In this paper, Kronrod extensions of Chakalov-Popoviciu quadratures are introduced. We study some cases of Chakalov-Popoviciu-Kronrod quadrature formula for a subclass of Gori-Micchelli weight functions, as well as for the generalized Chebyshev weights. For the Gori-Micchelli weight functions in the case of the Gauss-Turán-Kronrod quadratures we succeeded to find very effective error bounds, for functions analytic on confocal ellipses.

..........MIT 2009 ....

Minakov A., SFU, Krasnoyarsk
Dekterev A.A., IT SB RAS, Novosibirsk

New algorithm for numerical simulation of incompressible flow with free surface and moving solid bodies

Incompressible flows with free surface and moving bodies are often occurred in the natural phenomena and technological processes. Examples of such flows can be found in any industrial applications. To solve effectively such kind of a problem it is very important to skill for designing various devices. There are a number of algorithms solving the problems with free surface. The most widespread algorithm is a VOF (volume of fluid) method [1]. Owing to the simplicity it is easily built in algorithm of incompressible flows calculation based on the solving of the Reynolds equations system. In the paper the results of validation and application of in-house CFD code σFlow are pre-

sented. The numerical technique of the code is based on the Reynolds equations system solving. The solving of system of the equations is carried out by widely known method of control volume. The VOF method validation was carried out on a water damb-break problem and a problem about finding of speed of bubbles emersion in the channels filled with liquid. Numerical experiments have shown that the quality of a method of part of liquid phase in a cell transfer equation solving essentially influence on the VOF method results. So in the paper various convective part of transfer equation discretisation schemes were paid attention to. In the paper a VOF-like approach was used to simulate complex-geometry solid body motion with incompressible flow. As in the VOF method, the value of solid phase volume fraction in a cell and the corresponding transport equation are introduced. Testing the algorithm was carried out on a problem of incompressible flow around sphere and cylinder, a problem of physical pendulum oscillations in viscous medium a problem of solid sphere fall in viscous medium. High accuracy and efficiency of the method were shown by the testing. Some examples of methods use for modeling of engineering problems with free-surface and moving body are given in the paper. Highly-effective algorithm for solving of turbulence unsteady incompressible flow with free surface taking into account surface tension was realized. A number of test problems were solved. The calculating results are in good agreement with experimental data. The algorithm was successfully applied for a number of application problems. According to the results, suggestions which allow essential increasing efficiency of the equipment and technological processes were made.

...........MIT 2009.............

Mitic Z. D., Faculty of Technical Science, Kosovska Mitrovica
Petkovic M. D., Faculty of Science and Mathematics, Kosovska Mitrovica

Characterization of heavy doped semiconductors using analytical approximation of Fermi integrals

In heavy doped semiconductors the charge carriers have energy distribution according Fermi-Dirac function. Because that the carriers concentration and electric field and potentials in surface layers versus Fermi level relations are expressed as Fermi integrals. In this paper we are analyzed some analytical approximations of Fermi integrals order of one half and tree half and their applicability for calculation of carrier concentrations and surface electric field in heavy doped semiconductor. These results are also applicable on polycrystalline grains of polysilicon films.

...........MIT 2009.............

Moskvichev V.V., Presidium of Krasnoyarsk Scientific Center of SB RAS, Krasnoyarsk

Applied problems in probabilistic risk-analysis of technical systems

The study presents generalization of causes of failure and classification of the limit states for complex technical systems (CTS). Proposed are models and algorithms for risk-analysis of CTS, and data base for applied problems solving. Calculations are based on probabilistic models of defects, crackresistance properties, loading conditions, and stress-strain and limit states. Assessment of structural risk is determined by the fracture probability of structure elements for a given type of limit state. Model calculations of risk-analysis are carried out for a number of CTS constructions including components of nuclear and space engineering, pressure vessels and pipelines.

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Moskvicheva L.F, Institute of Computational Modeling, Krasnoyarsk
Burov A.E., Institute of Computational Modeling, Krasnoyarsk
Bogulskaya N.A., Institute of Computational Modeling, Krasnoyarsk

Module structure of a master course "CAD and CAE systems"

A teaching-methodical complex on «Computer Aided and Computer Aided Engineering Systems» has been developed as part of a master program for specialists in carrying and lifting machines, and technological complexes. The discipline is indented to provide students with fundamental knowledge on application of computer technologies in solving scientific and engineering problems, as well as to develop skills in modeling, design and analysis of technical objects, developing engineering documentation. The course consists of three modules. The module "Computer technologies in solving research problems" deals with methods used for solving engineering tasks and elaborating experimental data with means of MatLAB and MathCAD software. The module "Design and engineering in graphical CAD" teaches students how to use CAD-technologies in design and analysis of lifting machines. Digital prototyping of items and engineering documentation are developed using Autodesk Inventor software. The module "Computer aided engineering analysis" provides in-depth understanding and practical skills required in design and analysis of technical objects. The training is based on application of ANSYS software. The main objectives of the module are: - fundamentals of mathematical modeling, numerical methods used to identify and analyze engineering problems; - finite elements methods in solid mechanics; - analysis of stress and limits states of structural components.

Odalovic M.T., Faculty of Science and Mathematics, Kosovska Mitrovica
Petkovic D.M., Faculty of Science and Mathematics, Kosovska Mitrovica

A stochastic model of gamma-ray induced charge in silicon dioxide films of mos transistors

In this paper a stochastic model of gamma-ray irradiation effects on density of induced charge in silicon dioxide films of MOS transistors is explained. In this model the we are assumed that both of irradiation traps creation and charge generation-recombination are stochastic processes. For estimating gamma-ray induced charges spatially distributed in silicon dioxide films Monte Carlo method was used. The developed model enables the gamma-ray induced threshold voltage shift determination as a function on gamma-ray doses. These results are compared with experimentally determined threshold voltage shift of gamma irradiated MOS transistors and satisfactory agreements are obtained.

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Alexandros Leontitsis, University of Ioannina, Ioannina
Epameinondas Lekkas, General Hospital of Preveza, Preveza
Eugenia Toki, University of Ioannina, Ioannina
Jenny Pange, University of Ioannina, Ioannina

An approach on Cronbach's alpha

In this work we propose the practical use of the Cronbach's alpha statistical significance problem. This coefficient measures the reliability of a questionnaire's answers. Many analytical tests have been developed over the years which gave birth to very complicated formulas. A previously adopted simulation approach to the solution of this problem takes advantage of the computational power in order to give exact results for the distribution of the null hypothesis regarding this coefficient. The application of this coefficient may apply to statistical analysis of medical data.

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Pavicevic Z., Faculty of Science and Mathematics, Podgorica

Hyperbolic geometry, curvilinear angles and points of porosity in investigation of boundary properties of functions

The curvilinear angle in the open unit disk in the complex plane with the vertex a is a region generated by the hyperbolic disk with the hyperbolic center at a point w and the hyperbolic radius r when w passes along Jordan curve that ends at a point a from the boundary of the disk. We investigate possibilities for cover of region that arises by arc extension of curvilinear angle with the vertex a by curvilinear angles whose vertices are points of the set E on the boundary of the unit disk for which the vertex a is not the point of porosity. The obtained results can be used in the investigation of boundary properties of arbitrary function defined on the open unit disk.

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Pchelnikov D.V., Institute of Geology and Mineralogy for SB RAS, Novosibirsk
Dobretsov N.N., Institute of Geology and Mineralogy for SB RAS, Novosibirsk
Sladkih L.A., Data Reception and Processing Center for West Siberian Region, Novosibirsk

Crop forecasting system based on object-oriented monitoring concept

Crop yield forecasting is very important task for agricultural development in Siberian region. Nowadays all information concerning arable lands usage in Russia is provided by farmers. Lack of reliable information points at the necessity of development of agriculture monitoring system based on remote data, which will be independent from the information provided by the farmers. Since 2006 Novosibirsk Meteorological Survey has been developing agriculture monitoring system for Novosibirsk and neighborhood regions. The EPIC crop yield forecasting model is used as base model with some regional adaptation. This presentation discusses usage of object-oriented GIS architecture, which is specially developed for motoring tasks, both automate data handling process and improve of measure parameters quantity, as well as greater ability of system adaptation for local and regional conditions. The main system component is the agriculture field observation model. This model is based on the observation model abstraction class, which uses different data exchange interfaces and allows using any different data sources including satellite and meteorological data as well as field observations. Supposed architecture doesn't require initial definition of the agriculture field geometry. The only base location of the monitoring object is required. It allows starting the monitoring having minimal information and then collecting the required data in process.

Peregudin S.I., St. Petersburg State University, St. Petersburg
Kholodova S.E., St. Petersburg State University, St. Petersburg

About geostrophic motions in a rotating spherical layer of a non-uniform electrically conducting fluid

Research of mechanisms of generation of a magnetic field of the Earth owing to three-dimensional large-scale movement of the nonviscous, incompressible, non-uniform ideally spending electrowire rotating liquid concentrated in a liquid terrestrial kernel is conducted. The offered mathematical model of investigated physical process represents the closed system of the equations in the private derivatives, consisting of the equations of hydrodynamics taking into account rotation of the Earth, Lorentz's force and the corresponding equations of magnetic dynamics with necessary boundary conditions. With use of spherical co-ordinates and scales of functions, suitable the analysis of mathematical model is made for calculation of three-dimensional movements with the big time scale and spatial horizontal scale, comparable with radius of the Earth. The basic idea of the analysis consists in construction of the scheme consecutive approach in which geostrophe approach is the first step. The specified method of the analysis allows, without being limited to heuristic reasonings, to deduce the general geostrophe equations describing movements as homogeneous, so and the stratified electrowire rotating liquid. The analytical decision of system of the nonlinear equations in the private derivatives, modelling geostrophe movement in a layer of the ideal electrowire stratified rotating liquid is received. The analysis of structure of the presented fields magnetic hydrodynamics values allows to draw a conclusion on justice of a hypothesis of S.I.Braginsky about existence of strong changes in the thin layer of a terrestrial kernel adjoining border with a cloak.

Petkovic D., Faculty of Science and Mathematics, Kosovska Mitrovica
Arandjelovic I., Faculty of Science and Mathematics, Kosovska Mitrovica

On the convergence of diagonal approximation

In first part of this talk we present some recent results on the convergence of Diagonal approximations obtained by A.A. Gonchar and E.A. Rahmanov. Fulther we give solution of one conjecture proposed by A.A. Gonchar. In the last section we prove some new results.

Petkovic D., Faculty of Science and Mathematics, Kosovska Mitrovica
Petrovic M., Faculty of Science and Mathematics, Kosovska Mitrovica

A truly third order finite volume schene on quadrilateral mesh

A third order finite volume method on a quadrilateral mesh is presented. By using quadrangles instead of rectangles as a basic element of the mesh, full generalization is archived. This work holds on a simple but valuable conservative rule: inside a certain special domain (volume) the total amount of a contained quantity (such as mass, energy, momentum) is preserved. Said in another way, the total quantity in the volume doesn't change except by flow (or due to the fluxes) across the boundary of a domain. Efficient tools for solving the conservation laws are the finite volume methods. These methods are dealing with volumes (cells) and with averaged quantities within. In each of these cells we have exact conservation. The dynamics of the average is determined by point values of the flux along the boundary. The aim is to obtain a third order accurate numerical solution. This gives a motivation for the reconstruction of the numerical flux by some known functions (polynomial, hyperbolic, logarithmic). In this work local double logarithmic reconstruction was used. The components needed for developing LDRD functions are second order approximation to the first derivatives. These approximations are actually a crucial problem in this thesis and were solved specifically according to multidimensional numerical integration theory.

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Petrovic I., Higher Education Institution for Electrical Engineering and Computing, Beograd
Petrovic M., Higher Education Institution for Electrical Engineering and Computing, Beograd
Spalevic P., Higher Education Institution for Electrical Engineering and Computing, Beograd

Second order statistics of SC diversity system in the presence of fading

In this paper second order statistics of SC (Selection Combining) macrodiversity sistem's in presece of varius clases of input feding of macrodiversity sistem's are analized. Inputs of microdiversity sistem's are varius combining of high speed and low speed feding that are modeled with Vabull, Nakagami – m, Raly and Rice distribution. Macrodiversity SC sistem consist two microdiversity sistems and opserve signal selection based on their averige outputs powers that is modeled with Gama distribution. Gained results are applied in modeling and designing of wireless comunication sistems, in defin ing parameters of equivalent code chanel based on Marcovie model with finite number of states, as well as assessment of posibility package erors with finite lenght.

.... MIT 2009 ....

Petrovic I., Higher Education Institution for Electrical Engineering and Computing, Beograd
Stefanovic C., Higher Education Institution for Electrical Engineering and Computing, Beograd
Sekulovic N., Higher Education Institution for Electrical Engineering and Computing, Beograd
Petrovic M., Higher Education Institution for Electrical Engineering and Computing, Beograd
Stefanovic M., Higher Education Institution for Electrical Engineering and Computing, Beograd

Second order statistics of ratio of two random variables

In this paper, joint probability density function of ratio of two random variables and its first derivative is determined. Furthermore, for ratio of two random variables, level crossing rate is derived. Random variables have Rayleigh, Rice, Nakagami-m and Weibull distribution. Obtained results can be used for evaluation the performance of mobile telecommunication systems operating over fading channels. Numerical results are presented to illustrate the proposed mathematical analysis.

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Petrovic L., Faculty of Science and Mathematics, Kosovska Mitrovica
Stanojevic D., Faculty of Science and Mathematics, Kosovska Mitrovica
Dimitrijevic S. Faculty of Science and Mathematics, Kosovska Mitrovica

Statistical causality, weak solutions and martingale problems of stochastic differential equations driven with brownian motion

The paper introduces a statistical concept of causality in continuous time in filtered probability spaces which is based on Granger"-"s definition of causality. Then, we consider Ito's stochastic differential equation driven with a process of Brownian motion and show the equivalence between some models of causality and weak uniqueness (for weak solutions of stochastic differential equations). We also show that the given concept of causality is closely connected to the extremal solutions of martingale problem and stopped martingale problem.

.... MIT 2009 ....

Petrovic V. V., Higher Education Institution for Electrical Engineering and Computing, Beograd

Kinetics of sintering with mathematical theory of Gropjanov

Ceramic materials have been in use in many different areas of human wellbeing for a very long time. Important domains in ceramic materials are those materials that are applied in electronics. Our research is focused on magnesium-titanate (MgTiO3). Most common way of obtaining this material is by

using the process of sintering. During mechanical activation inorganic materials are grinded when grain size is being reduced. Crystal structure submits distortion and also change, what is leading in some systems to chemical reaction and formation of new compound. In this work we are explaining mechanical activation influence on sintering kinetics in system MgO-TiO2 with mathematical theory of Gropjanov. We noticed temperature drop and time reduction needed for MgTiO3 sintering when duration of mechanical activation is longer.

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Pikula M., Faculty of Philosophy, Istočno Sarajevo
Vladicic V., Faculty of Philosophy, Istočno Sarajevo

About structures on the set of triangles

In this paper we consider possibility of introduction algebraic structures on the set of triangles, each of triangles we will represent as element of R3, with x1>0, x2>0, x3>0, where present lenght sides of triangle.

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Popovic Z., Faculty of Economics, Nis
Bogdanovic S., Faculty of Economics, Nis

Mathematical modelling of capital reinsurance

The main topic of this paper is the capital reinsurance of enterprises.The notion of capital reinsurance, its classification as well as mathematical models used in defining the retention are discussed here.The models displayed in the paper are examined under the assumption that the ideal conditions exist, which is ,generally, not true in practice.Reinsurance denotes the reinsurance of capital i.e. insurance of insurance.Reinsurance represents the most efficient form of risk sharing among insurance companies.

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Popovic B., Faculty of Science and Mathematics, Nis,
Stojanovic V., Faculty of Science and Mathematics, Kosovska Mitrovica

Discrete autoregressive model of conditional duration

In this paper we propose the discrete model which describes the time of changes in stock prices. We modeled the changes in some law frequency series. As a basic distribution, we used a discrete type distribution and also an autoregressive sequence. So, we named this model Discrete Autoregressive Conditional Duration model (D--ACD). The main stochastic properties of the model are given. We apply this model on the real data set from Belgrade Stock Exchange.

Radenkovic B., Faculty of Organizational Sciences, Beograd

Information technologies and religion

The subject of this paper is analysis of the historical development of information and communication technologies as well as their connection with religion. The paper gives an overview of methods of communication between people, communication with macrocosm in which the human history goes on and communication with inner microcosm of each human being. The historical analysis aims to discovering laws and analogies that are important for creating, developing and the future of human communication regarding myths and religious sources. Internet today is the dominant media for communication in human society, and therefore represents central issue in historical analysis. Many religious, historical and scientific resources have been used while working on this paper. For the vision of future the prophets' sources have been used. The focus in this paper is also on achievements of Serbs for developing modern communication.

Radenkovic N., Faculty of Science and Mathematics, Kosovska Mitrovica

Data warehouse solutions for CRM

In today's highly competitive business environment, CRM (Customer Relationship Management) systems, which provide the framework for analyzing customer profitability and improving marketing effectiveness, have become

an indispensable component in enterprise information systems. Typically, CRM activities include data analysis, campaign design, response analysis of customer data. To effectively support such activities, a data warehouse (which is a repository that integrates information from multiple operational data sources) must be developed to act as the back-bone of CRM systems. A data warehouse is a core part that determines the performance of CRM systems and quality of CRM services.

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Radosavljevic D., Faculty of Technical Science, Kosovska Mitrovica
Ristic J., Faculty of Technical Science, Kosovska Mitrovica
Milojevic S., Faculty of Technical Science, Kosovska Mitrovica
Milenkovic N. Faculty of Technical Science, Kosovska Mitrovica

MS Excel in mathematics

Mathematics is a fundamental discipline which is used for formulating and solving real problems. Nowaday computer became mathematical tool par exellance. We can use many specialized packages of mathematical tools, such as: Mathlab, MathCad etc., to facilitate problems solving. Although those programs have many advantages upon MS Excel, it can be used for solving broad class of mathematical problems. MS Excel is able to solve problems from different mathematical branches, such as: analytical geometry, linear algebra, mathematical analisys, differential equations, integral equations, probability theory, statistic, mathematics for engineering, etc.

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Radosavljevic D., High Business Technical School, Uzice
Trajkovic S., High Business Technical School, Uzice
Predrag R., High Business Technical School, Uzice
Petrovic S. High Business Technical School, Uzice

Creating WEB applications using FrontPage and Access

The paper gives a brief description of student services in the high-school institution, a description of the database performed for conducting business in the same services and described in detail as HTML for access to data in the database. Key words: Web, database, HTML pages.

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Radosavljevic D., High Business Technical School, Uzice
Trajkovic S., High Business Technical School, Uzice
Ralevic P., High Business Technical School, Uzice
Panic S., High Business Technical School, Uzice

Information system of student services done in programs C++

The paper gives a brief description of student services, concepts and methods of programming and interface description. Modeling of real programs with the help of modern technology and design simulation software includes analysis of the structure and behavior of the observed system, registration knowledge using verbal, graphic, mathematical or logical model and the model in appropriate software. The aim of this paper is to develop and simulate the work of student services using object-oriented programming in C + +. Namely, the program should complete all the requirements of the user that contains all the necessary real elements which would be used in student services.

MIT 2009

Raicevic A., Faculty of Technical Science,Kosovska Mitrovica
Prica B. Faculty of Technical Science,Kosovska Mitrovica

One solution for differential equation for non-linear mode PLL loop

In this paper nonlinear mode PLL loop is shown and its differential equation is presented in detail. This equation belongs to the group of nonlinear differential equations which solution can not be found in closed form. In fact, the solution which can be found is numerical, or approximate, and variation depends on type of approximation. Of course, nonlinear mode PLL loop is not desirable, because it results in big distortions. To avoid this, we process boundary condition which gives us critical values of circuit parameters with jump phenomenon in response.

MIT 2009

Raspopov V.E., Siberian Federal University, Krasnoyarsk

Numerical identification of a free member of a special type of the parabolic equation

The inverse problem of the identification of a specially formed function of the sources of a one-dimensional parabolic equation is reduced to direct one. The direct problem is nonlinear with non-local input data. The difference schemes of the second order of approximation are constructed. Test calcu-

lations are carried out. The calculating experiment shows the convergence of difference problems. The solution's dependence on the errors in redefinition's terms is numerically analyzed. The case, when redefinition conditions are set discretely, is considered.

.... MIT 2009 ....

Rogalyov A. N., Institute of Computational Modeling SB RAN, Krasnoyarsk

An analysis of complex systems reliability and the estimation of maximum deviations of solutions

In this report it is offered to estimate ODE solutions bounds under action of final, constantly operating perturbations. Among mathematical descriptions of similar problems we will allocate control of the guaranteed safety conditions and reachable sets estimation. Examples of the constructed guaranteed bounds of solutions in problems of the estimation of the zones of dangerous states and threshold values of parameters are resulted.

.... MIT 2009 ....

Rychkov A.D., Institute of Computational Technologies SB RAS, Novosibirsk
Shokin Yu.I., Institute of Computational Technologies SB RAS, Novosibirsk
Miloshevich H., Faculty of Science and Mathematics, Kosovska Mitrovica

Application of pulse aerosol system for fire fighting in coal mines

A working of pulse aerosol system of fire fighting (PASFF) for extinguishing of initiation of combustion of air - methane mixture in shaft bottom and drift of coal mines is modeling. Results of numerical experiments were shown that PASFF can stop of movement of shock wave in burning air - methane mixture and to provide effective suppression of combustion process in the mixture. Furthermore the using of PASFF may protect people and mining equipment from shock wave impact.

.... MIT 2009 ....

Sadovskaya O.V., Institute of Computational Modelling of SB RAS, Krasnoyarsk
Sadovskii V.M., Institute of Computational Modelling of SB RAS, Krasnoyarsk

Numerical analysis of the waves propagation processes in elastic-plastic and granular media on multiprocessor computer systems

Processes of the waves propagation in elastic-plastic and granular media under small strains are analyzed within the framework of a new rheological model. The model takes into account different resistance of materials with respect to tension and compression. Constitutive relationships are formulated in the form of variational inequalities. The Mises-Schleicher destruction criterion is used to describe the granularity of medium, and the Mises yield criterion is used to determine the plasticity of grains. Algorithm for numerical realization of the model is worked out on the basis of the splitting method with respect to physical processes and space variables. For the solution of one-dimensional hyperbolic systems of equations in space directions, the explicit monotone ENO-scheme is used. Special procedure of the stresses correction is applied to take into account irreversible strains. Parallel program system is proposed for the analysis of 2D and 3D dynamic problems on multiprocessor computer systems. The programming was carried out in Fortran using the MPI library and the SPMD technology. The universality of programs is achieved by a special packing of the variables used at each node of the cluster into large one-dimensional arrays. Computational domain is distributed between the cluster nodes by means of 1D, 2D or 3D decomposition so as to load the nodes uniformly. The parallelization is performed at the stage of splitting the problem with respect to the space variables. Testing of the algorithm and the programs was fulfilled on 1D problems, a good correspondence between the results of computations and exact solutions was obtained. Numerical computations of 3D interaction of signotons (shock waves, on the fronts of which the strain changes its sign) in inhomogeneously loosened granular medium with the cumulative splash formation, computations of the waves propagation in double-layer heterogeneous medium with curvilinear interface under action of concentrated impulsive load on one of its boundaries, and also similar computations for a medium with rigid inclusion were carried out at the clusters of Institute of Computational Modeling of SB RAS (Krasnoyarsk) and Joint Supercomputer Center of RAS (Moscow). The level surfaces of velocities and stresses, seismograms of the particles displacement, on which one can see incident longitudinal and transverse waves, conical, reflected and refracted waves, the Rayleigh surface waves, were constructed on results of computations.

Serovajsky S., al-Farabi Kazakh national university, Almaty

Identification Parameter Problem for Nonlinear Oscillation Systems

We consider the oscillation system described by the boundary problem for the nonlinear hyperbolic equation. The parameter of the nonlinearity can be large enough. Therefore this problem is ill-posed: we can guaranty the existence but not the uniqueness of the solution. We have the inverse problem with unknown absolute term of the equation and the addition information about the state function on the part of the given set. At first we use the quasisolution method. The quasisolution of our inverse problem is the pair "absolute term – state function", which satisfies to the boundary problem and minimizes the corresponding discrepancy. We prove that this minimizing problem has a solution. Our second step is the using of the Tychonoff regularization method. Thus we consider the regularized functional, which is the sum of the discrepancy and the stabilizator with a numerical parameter of regularization. We prove that the limit of the value of the discrepancy in the solution of the regularized problem is equal to the minimal value of the discrepancy. So the solution of the regularized extremal problem can be used as the approximate value of the quasisolution for the small parameter of the regularization. We solve the regularized extremal problem by means of the penalty method. We prove that the received penalty variational problem has a solution. The more difficult result is the convergence of penalty method in the weak form. Then the solution of the penalty variational problem can be choosing as the approximate solution of the regularized problem. The penalty problem is the classical variational problem. It can be solved with using of the standard methods of the optimal control theory. So we get the approximate value of the solution of the initial inverse problem in the end.

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The computational experiment of the spherically symmetric modeling of deep-seated geodynamics

In present paper computing model allowing considering geodynamic process of expansion, compression, heating and cooling of the Earth is suggested. Dynamic of geosphere is investigated in the context of viscous heat-conducting coercible gas when density and viscosity of medium depend on time and coordinates. Suggested model allows considering not only crust and mantle of Earth but also internal structure including Earth core.Thus, in this paper dynamics of the inner structure of the Earth is described by a model of a vis-

cous compressible heat-conducting medium in the form of the Navier-Stokes equations. For the discretization of the spherically symmetric model the finite element method is used. The method is shown turned out to be highly sensitive to the state equation used. This results in decreasing or increasing the radius of the Earth, smoothing the boundaries of phase, chemical, or metamorphic transitions of the Earth's geodynamic layers. Therefore, in addition to the solution of the mathematical problems, a correct and accurate formulation of the state equation on the basis of the modern notion of the substance of the Earth and its physical and chemical properties at corresponding temperatures and pressures is of major importance.

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Численное моделирование одной модели релаксационной фильтрации

Рассматривается неустановившаяся изотермическая фильтрация капельно-сжимаемой вязкой жидкости в неподвижной изотермической и слабодеформируемой пористой среде с ограничивающей поверхностью. Линейная релаксационная фильтрация описывается законом сохранения импульса сил сопротивления, линеаризованным законом сохранения массы жидкости, определяющим соотношением для импульса сил сопротивления и определяющим соотношением для массы жидкости. Рассматривается модель фильтрации по закону Дарси в релаксационно-сжимаемой пористой среде. Ставится начально-краевая задача, и она решается классическими численными методами, методами Монте-Карло и вероятностно-разностным методом.

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Content based link spam detection

The Internet becomes not only means of information reception and dialogue, but also business dealing means. The site finding by the most popular search queries and site position in list of search results is an actual problem for the site owners. Because sites of one subjects sometimes happens too much, and everyone wishes to be at top of list of search results in queries, owners use

spam of search engines (web spam). There is a considerable quantity of the techniques, used to web spam. We will consider one of them – a link spam.

The increase in a links number at sites became one of the basic methods of search engines manipulation. Manipulation scales constantly grow. If several years ago the basic way was the so-called exchange of links which was spent manually now to it on change various ways of automatic placing of links have come. It is possible to allocate some variants of such placing:

1. Use of specialized programs for automatic addition of links in catalogues, guest books, forums etc.

2. Purchases of links at advertising brokers.

With the first variant search engines have learnt to struggle, revealing resources where there is a possibility of simple, not moderated addition of links. The weight of links from such resources strongly decreases. Placing of links with use of advertising brokers represents much big problem for search engines.

Now in Russian segment the Internet operates about ten the large advertising brokers who are engaged in sale of text links. Only one of them, Sape.ru, has possibility to place the links on more than 55 million pages. In spite of fact that links in such systems name "advertising", their main objective - not advertising for the purpose of attraction of visitors (links take places often in the most imperceptible places of page and their user simply does not notice), and improvement of the position in search engines. Cost of such "advertising" also happens often nominal, sometimes only 0.01$ for a month of placing.

In what the basic danger of the large-scale reference spam, observed the last some years? Danger consists that links are actively used by modern search engines for ranging of search results. With links it is connected concepts of the Quote Index in Yandex and definition PageRank in Google. The mass increase in links of an unnatural origin (link spam) can strongly "spoil" efficiency of their job. The situation becomes complicated that "paid" links can take places on any sites including on very dear and popular resources. Thus, there is impossible a simple division of pages on "good" and pages for link spam.

Detecting of Link spam

Let's consider signs of definition paid links:

1. The links noted as advertising. For this purpose it is necessary to see link vicinity (the text, adjoining to the link). Signs of paid link - words: "Advertising", "Sponsors", "Our Partners", etc.

2. The big block of links. The raised density of links on a small site of page (block of links) can testify to their unnatural origin.

3. Links to agencies on sale of links/advertising. Often near to advertising blocks it is possible to see links to advertising brokers.

4. On a site there is information on how it is possible to buy links. If on site or about the block of links such information contains, then links are paid.

5. Thematic affinity of link. If text of link or site subjects on which the link strongly conducts differs from page subjects on which the link is located it is possible to consider the link as a spam.

However definition of link subjects not always is a trivial problem. The link can settle down in the offer (though and not to be a part of body page text). Therefore to be guided by the text in immediate proximity to the link it is not always justified.

Often links specify in a resource with enough general subjects (for example, at references to the source of news or a site of the author of any article).

For correct definition of link subjects deep analysis site subjects on which link conducts can help. This problem difficult also demands time considerable quantity.

6. Thematic affinity of next links. For this purpose it is necessary to analyze subjects of group links placed on page. If links are not thematic and have disorder of subjects, they are advertising.

7. The location of links. For this purpose it is necessary to analyze an arrangement of links on page. Than further the link from the basic maintenance of page, it is especially probable, that they are advertising. For example, often such links take places in the bottom of page or in the right column when the body text settles down in the middle.

8. Code of links. Many automated systems of links placing (stock exchange, exchangers, brokers) establish code automatically on template. Presence of identical links block on code can specify in their spam origin.

9. Dynamism/time of links life. Frequent change of links on pages without change of other maintenance can testify to their unnatural origin. Links can or disappear for a while simply from pages (in case of malfunctions of systems on automatic placing of links), or their part can be replaced with new links.

10. The message on paid links. Competitors, the former buyers of links, the former employees can inform on paid links.

11. Viewing of page by person. Viewing of pages by a moderator and detect link spam manually.

Algorithm of link spam detection

Now we will consider the algorithm, capable to detect spam links. It consists of several stages.

Stage 1: Formation of a preliminary set of spam links S. The set is formed of following references:

• chosen manually;
• defined by algorithm early, as spam;
• defined by analysis of advertising brokers code.

The greatest interest represents last way. Some advertising brokers have distinctive features in placing of codes which could help to identify.

One more method consists in tracing of dynamics of change of the maintenance of page. If during time for page the group of links this group can be

paid links changes only.

It is necessary to notice, what not all links defined by algorithm as a spam should be brought in set S but only what signs of a spam have obviously expressed character (to exclude casual hit of links in the spam category).

At a stage 1 it is possible to use various algorithms classification and machine training.

Stage 2: Detection of spam links on the basis of page content. The basic idea consists in the analysis of page content and detecting of spam signs. For each spam sign the foul shot is imposed on the link qi. If the total foul shot exceeds a certain threshold, the link admits a spam.

Step 1. The page is scanned on presence of links Sb, put into list S generated at the Stage 1. At detection of such links the area round them is scanned. If links are found out, it is appointed a foul shot q1 which size decreases in process of removal from link Sb.

Step 2. The page is scanned on presence of signs of the advertising block. As a sign can serve words "Advertising", "Sponsors", "Our Partners" etc. At detection of advertising block signs, to links in its vicinities is appointed a foul shot q2.

Step 3. The page is scanned on presence of links to the advertising broker. At detection of such signs of the advertising block, to links in its vicinities it is appointed a foul shot q3.

Step 4. The page is scanned on presence of information on sale of links (and about what can be bought). At detection of such signs, to links in their vicinities it is appointed a foul shot q4.

Step 5. Page is scanned on presence of the big block of links. If the quantity of links in the block more than a certain threshold, is appointed it a foul shot q5.

Step 6. Links are scanned on signs of a code of the advertising broker in case of which detection to links it is appointed a foul shot q6.

Step 7. Conformity of subjects of the link and the general subjects of page is checked. In case of discrepancy, the link it is appointed a foul shot q7. For subjects check often happens simply enough to scan the page text on coincidence of words to the link text.

Step 8. Conformity of subjects of the link and subjects of links in its vicinities is checked. In case of discrepancy, the link it is appointed a foul shot q8.

Step 9. The place of placing of the link is checked. If the link is in the end of page, to it is appointed a foul shot q9.

Stage 3. The analysis of site structure for the purpose of spam revealing. This stage is the most difficult. Its purpose - to reveal features of structure of a site and a place on pages where there are "paid" links. For this purpose from site pages all changing content (except links) leaves. Further association of pages with an identical template in clusters is made. The following stage: for each cluster repeating links leave and areas where links vary on everyone cluster pages are identified. For the links entering into such areas it is appointed a foul shot qr.

Stage 4. For each link all added foul shots are summarized. If the sum exceeds a certain threshold, the conclusion, that the link is spam. In this case the link is put into list S.

Results

The offered algorithm shows good results in definition of spam links. Precision of algorithm is 0.94, Recall - 0.89.

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A system for an automation of extraction of table information from documents of various formats

For the purpose of solving many research and applied problems it is necessary to extract data from the tables contained in various documents. The paper discusses the system for an automation of extraction of the tabular information from documents of various formats. Unlike existing systems of extraction of the tabular information the proposed system uses the Enhanced metafiles as the input data. It allows applying this system to documents presented in various formats, for example, DOC, XLS, PDF, the ASCII-text or HTML. The system provides automatic table detection in documents, table segmentation on separate cells, the functional analysis of the table (definition of header and data cells), and the structural analysis of the table (definition of relationships between cells). The extracted tabular information can be presented as relation in terms of relational databases. The system has demonstrated high performance for table processing in scientific papers, the government and medical statistical reports, financial documents.

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Website ranking for scientific & research organizations of the Republic of Serbia

In the present work we analyze the websites of the Republic of Serbia Academic Institutions using webometrics techniques. In order to determine the quantitative characteristics of the web sites, we use Yandex, Google and Ya-

hoo search engines. The official domains of scientific organizations of Serbian Academy of Sciences and Arts and Zajednice instituta Srbije (ZIS) have been analyzed.

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Building a resource center for the Grid infrastructure

Increasing efficiency and availability of informational and computing resources is one of the key problem addressed by integrating distributed resources into common system. The integration is achieved through building unified interfaces available via dedicated or public network infrastructure. One of the essential participants in an integrated system is the resource provider that makes its resources accessible on demand. Resource providers may share one or more resources. Providers that share many resources of different type are called Resource Centers. We define the concept of a Resource Center and study possible approaches to the organization of the working process that run within a resource center or involve several resource centers. Further we compare the notion of a Resource Center in a Distributed Informational and Computing Environment and the well understood notion of a Collective Access Center. Finally we present organizational and technological solutions to support the operation of Resource Centers.

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Numerical Simulations of Long Waves Processes at Coastal Zone Using Shallow Water Model Memory Dr. A. N. Militeev (1943-2003)

Приводятся результаты совместных исследований в период 1980-1999 в области численного моделирования в рамках математической модели мелкой воды. Небольшая часть из этих результатов была ранее опубликована в ограниченном виде и в труднодоступных изданиях. При разработке численного алгоритмы мы исходили из необходимости получения устойчивого алгоритма, обеспечивающего приемлемое решение в условиях резко неоднородной области с возможным образованием разрыв-

ных решений и осушенных отдельных участков области. Была разработана двумерная, явная конечно разностная схема для расчета течений с любым, даже очень большим, числом Фруда при наличии разрывов большой интенсивности, а также непрерывных течений с большими изменениями глубины. Течения подобного рода возникают, в частности, при накате длинных волн, особенно на берег со сложной топографией, при входе оползня в водоем и т.п. Было проведено моделирование наката на реальный берег и затопление Северо-Курильска от цунами 1952 (1982). На базе этой схемы была разработана двумерная, двухслойная модель мелкой воды и проведено моделирование схода оползня и образования волны в Сарезском озере (1988). Виду того, что большая часть результатов не была опубликована и утеряна, в данной работе приведены результаты новых расчетов по ранее разработанным алгоритмам и приведены сравнения с имеющимися результатами расчетов и измерений. Представлены результаты тестовых задач распада разрыва на горизонтальном и наклонном дне, моделирование оползня, входа оползня в водоем и образование длинных волн. Приведены результаты моделирования оползня Vaiont (October 9, 1963).

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Signal processing simulation based on the residue number system

Signal processing simulation based on residue number system in program package MATLAB is shown in this paper. Digital signal processing, based on residue arithmetic's, allows high speed signal processing that consist only operations of addition and multiplication. In the course of signal processing operation of division and condition code in the suggested arithmetic operations should be avoided. Program package MATLAB does not contains software for signal processing simulation in residue number system. Goal of this paper is development of software for signal processing simulation in MATLAB, with 31st order finite impulse response filter based on residue number system. Software should consist MATLAB functions for basic operations in residue number system , as well as functions for converting numbers from fixed point to integer and contrariwise. Results of filter response for unitary array and simply periodic function are shown.

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Mesoscale models for urban air quality research with high resolution

The results of application of developed meteorological and photochemical mesoscale models for numerical prediction of aerodynamics, physical and chemical processes above a city are presented. The main features of the meteorological model are possibility of explicit representation of some specific for urban territory ('heat iceland') atmospheric phenomena and taking into account interaction between boundary layer and surface with specific roughness and heat transfer for urban obstacles. The photochemical model has horizontal resolution up to 500 meters and allows predicting in detail influence of turbulent structure of an atmospheric boundary layer on transport and dispersion of primary and secondary pollutants in an urban air. Also it has both reduced kinetic schemes, modeling generation of troposphere ozone and more complicated schemes, taking into account tens of chemical and photochemical reactions between pollutants. The considered mesoscale models are numerically realized with supercomputers. These models are used to analyze influence of meteorological conditions and features of underling surface on generation and development of atmospheric circulations and pollution transport above idealized and real urbanized territories and formation of secondary pollutants near cities.

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Spence birational transformation in series

In this article are given varii formulae based on Spence birational transformation in series.These formulae are related to polylogarithms and to multiple sums and integrals.In the results are involved the values of Euler-Riemann zeta function.

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Use of the Monte-Carlo analysis for reliability assessments of structure elements

In this study, reliability assessment of structures by Monte-Carlo analysis is considered. Distribution functions of durability and structure operational safety under certain exploit conditions are taken as parameters for reliability calculation. It is assumed that the source of failure is a crack of random size. Loads and material properties are also considered to be stochastic with known probability density functions.

Calculation model for the crack growth rate is defined by a modified Volkov-Mikheev's empirical relationship, which variables are assigned by a random number generator at given probability distribution laws.

Calculated are the estimates for statistical reliability of structure elements with growing cracks (typical weld joints, pressure vessels, handling facilities, main pipelines).

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Application of Geographical information system on the maps

Communication, through ages of civilization is based on signs. A human knew to draw before he could write, and he represented his surrounding through things from nature. Man transforms the objects from nature into symbols, thanks to his ability for visualization. Modern cartography is defined as a science of transfer of graphical information, and the chart as an informational channel. Language of a cart is graphics, and cartography symbols are graphic elements. Map is a graphic-visual model of the space and cartography communication is graphic-visual communication. Then Gographical information system is necessary for processing more and more informations. Today is age of digital maps.

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Some result on cone metric spaces

In this paper we prove some fixed point results for non-self mappings on Cone metric spaces.In the paper we don't use the normality property of a cone in ordered Banach space.

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An idea for determination of zeros locations of complex differential equations

Question of evaluation of number of zero entire solutions of analytical differential equations is very old and very important question regarding the range of solution increase and coefficient range. Question of location of zeros is closely related to evaluation of zeros number. It is practical question, because the zeros of analytical solutions of analytical differential equations are isolated. This paper presents that the basic problem is the determination of fundamental Sturm's zeros of ordinary linear differential equations of second and fourth order. The following authors: D. Dimitrovski, M. Rajovic, M. Lekic, S. Cvejic, V. Rajovic and A. Dimitrovski have already presented criterion and algorithms through simple geometrical procedures for these zeros.

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Krasner's and Vukovic's Paragraduations

In our papers ([4], [5], [6]) and monograph "Paragraded structures" (groups, rings, moduls) [7], Marc Krasner and myself developed a theory of paragraded structures which generalises the theory of graded structures as is exposed in Bourbaki [1], as well as the previous Krasner's [3] and M. Chadeyras's [2] results.

Starting from Bourbaki's and Krasner's classic graded structures (groups, rings, moduls), which compose the categories that are not closed with respect to direct and cartesian product, we introduced algebraic structures wich have the property of closure and called this structures paragraded.

But, this is true only in trivial case for the graded groups, that is to say when there is only one of the starting groups with the starting groups with the trivial graduation.

Therefore, the achieved results justify the obtained generalisation. I shall talk about some new results and open questions.

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Geospatial Web information system for environmental monitoring in the area of oil and gas industry

Исследования мониторинга состояния окружающей природной среды в зоне действия предприятий нефтегазовой отрасли Красноярского края начались в Сибирском федеральном университете в 2008 году, при поддержке Министерства природных ресурсов и лес-ной отрасли Красноярского края. Основное внимание на данном этапе уделяется задачам оценки современного состояния компонентов окружающей природной среды, оценки эффективности действующих систем производственного экологического мониторинга, оценки потенциальных экологических рисков в районах размещения объектов нефтегазовой отрасли Красноярского края, и проч. Важной составной частью этих исследований является проектирование и реализация геоинформационной Интернет-системы экологического мониторинга, которая должна стать интегрирующей информационной основой проекта. Ее задачами являются организация технологической среды для интеграции формируемых в процессе мониторинга информационных

ресурсов, решение задач информационного взаимодействия пользо-вателей, создание централизованной базы геопространственных данных, набора интерфейсов и сервисов для визуализации и аналитической обработки накапливаемой информации, тематических веб-приложений. Реализация системы основана на открытом и свободном программном обеспечении ГИС.

В статье рассматриваются требования к системе, ее технологиче-ская основа, различные программно-технологические аспекты реализации. Созданная первая версия системы построена на основе свободно распространяемых технологий и программного обеспечения (open source). Для хранения данных использована СУБД PostgreSQL 8.x с модулем PostGIS. Основным программным языком для разработки выбран язык сценариев PHP 5.x. В разработке был использован ряд сторонних программных библиотек и модулей – Ext2js, TinyMCE, HTML_MetaForm, Smarty, PEAR, Zend Framework, и др.

Текущая версия системы доступна в Интернет на веб-портале «ГИС мониторинга состоя-ния окружающей природной среды в зоне действия предприятий нефтегазовой отрасли Красноярского края» (http://ecomo-nitoring.sfu-kras.ru/).

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On some analytical solutions for the model of the wind-induced motion of the viscous incompressible liquid (the case of three dimensions)

Рассматривается трехмерное стационарное ветровое движение одно-родной жидкости в замкнутом бассейне [1]. Предполагается, что нели-нейными членами в уравнениях движения можно пренебречь, на дне ставится условие проскальзывания, коэффициенты турбулентного обмена постоянны.

Известны аналитические решения для дрейфовой и геострофической составляющей течения в случае, когда членами с горизонтальной вязкостью можно пренебречь (модель Экмана) [2].

В настоящей работе рассмотрена общая постановка задачи для трехме-рного течения вязкой жидкости. Получено аналитическое решение как для дрейфовой, так и для геострофической составляющей скорости течения в бассейне прямоугольной формы. Решение для комплексной

скорости имеет довольно простой вид, позволяет легко проводить анализ изменения величины и направления скорости потока по глубине водоема в зависимости от ветрового воздействия, коэффициентов вертикального и горизонтального турбулентного обмена.

Найденные решения могут быть полезны при проверке работоспособности численных алгоритмов, предназначенных для расчета ветровых течений однородной и неоднородной жидкости [3]

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About gradient extension of successive over relaxation method of solution of system of linear and nonlinear algebraic equations

SOR method is used for solution of system linear algebraic equations successfully. The reason of this is both simplicity of realization and high rate of convergence in a case of precise assignment of optimal iteration parameter. Using of nonoptimal parameter appreciably decrease rate of convergence of SOR method. Iteration methods of solution of system linear algebraic equations and system bilinear algebraic equations have been considered in this paper. These methods are SOR in linear case and - successive over and block relaxation method in nonlinear case. Constant iteration parameter is replaced by diagonal matrix of parameters in these iteration schemes. Elements of this matrix are selected based on sequential minimums of error functional. Higher rate of convergence for our scheme than for SOR method is proved in linear case. Monotone decrease residual vector norm for general initial data is proved in nonlinear case. It may be showed nonlinear successive over relaxation method converge in case of restriction on nonlinear system operator. Our calculations show high efficiency of these methods.

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Stability of solution of stationary viscous incompressible fluid flow produced by a given pressure drop problem

It's considered mostly two problem definitions for Navier-Stokes equation set which has been written relative to velocity and pressure. One of them is most popular and consists in adherence conditions demanding on solid walls and velocity demand on flow boundary parts. Second problem definition consists in pressure demanding on flow boundary parts, so that flow is realized for pressure drop. In this paper we present the results of research of one-valued numerical solvability and stability of channel fluid flow pressure drop problem.

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Numerical simulation of three-dimensional non-stationary Navier-Stokes equation using «rotation - vector potential» formulation

The time-depended incompressible Navier-Stokes equations in three-dimensions are solved numerically. In the most cases this problem is formulated using the velocity and pressure variables and solved by splitting method. The advantage of this way is the relative simplicity of the algorithm realization. However, significant disadvantage of this way is difficulties to satisfy to the continuity equation at every physical time step. This problem is discussed by many authors [1]. In this paper we propose to use «rotation - vector potential» formulation. Thus, we automatically provide the solenoidal velocity field [2]. Depending on the way of the convective terms differencing the linear or nonlinear numerical system of equations is formed at every physical time step. The system is solved using the parallel minimal residuals iterative method with the multiparametric optimization based on the componentwise minimization of the approximate solution residual norm [3]. The method allows solving the linear and nonlinear algebraic systems of equations requiring only a minimum of information about the system operator. For example, in case of the linear system of equations it doesn't require that the system operator must be symmetric or fixed sign. Proposed solving method converges sufficiently fast for any starting data. Also the convergence acceleration procedure can be applied to it that increases the efficiency of the method convergence process. The comparison of numerical solution results with lab-

oratory experiments is given.

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About One Model Of Underground Cjal Gasification

The idea of underground gasification of coal has been stated more than a century ago to known Russian scientists D.I.Mendeleyew at research of the underground fires which have arisen from self-ignition of coal in Urals Mountains. D.I.Mendeleyew wrote « Concerning these fires of coal layers to it seems to me that it's possible to use them, governing them and correcting the matter so, that the combustion would occur as in a generator, i.e., at access of a few air». This statement has put initially possibility to control combustion conditions, so, ar burning and its products take place in a closed (isolated) volume. Actually, the burning occurs in the process involving many components of the natural environment, these components in the combustion process are undergoing significant changes. The two-dimensional model of underground gasification of coal is represented in a work we present. Let the coal layer lies on certain depth under a surface of the earth and has the set capacity. A high-temperature center is created in the fuel. There is a source of oxidizer on one of the boundaries, and a drain for the yield of gas on another boundary. As a result of that, there is an exothermic chemical reaction of decomposition occurring in the fuel, witch goes according to the diagram v1A1=v2A2+v3A3, where A1, A2, A3 - symbols of the fuel, the condensed product (coke) and a gaseous phase accordingly, vi, i=1,2,3 - the stoichiometric coefficients of these products. The mass flow rate of reaction is determined by Arrhenius's law. The formed coke enters reaction of oxidation with the oxygen, arriving from a source on a border of the center of burning. There are equations, written for the volumetric proportion of the fuel, coke and the gaseous phase, witch describe their changes over time. A temperature distribution in the thickness of breed and coal, taking into ac-

count their heterogeneity and heat exchange with external environment, is described by the heat conductivity equation, coefficients of which depend on spatial coordinates, time and from mass fractions of fuel, coke and gas. As a result, we get a system of the nonlinear differential equations, describing a process of coal gasification.

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