ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universitetis

ilia vekuas saxelobis gamoyenebiTi maTematikis institutis

wliuri samecniero angariSi

2010

0186 Tbilisi, universitetis q., 2, tel.: (+99532) 303040, faqsi: (+99532) 186645,
el. fosta: george.jaiani@viam.sci.tsu.ge

i. javaxiSvilis saxelobis Tbilisis saxelmwifo universitetis (Tsu)
i. vekuas saxelobis gamoyenebiTi maTematikis institutis
wliuri samecniero angariSi _ 2010

i. vekuas saxelobis gamoyenebiTi maTematikis institutSi (gmi) 2010 wlis manZilze sruldeboda 8 samecniero proeqti (granti) SoTa rusTavelis erovnuli samecniero fondis xaziT (ix. danarTi #1, gv. ¿2-15). garda amisa, gmi-Si sxvadasxva vadis (2-dan 11 Tvemde) SromiTi xelSekrulebis safuZvelze individualur samecniero proeqts amuSavebda 36 mecnieri-mkvlevari (ix. danarTi #2, gv. 16-25), maT Soris 1 – erovnuli akademiis wevri-korespodenti, 16 – mecnierebaTa doqtori, 9 – mecnierebaTa kandidati, 2 – samecniero xarisxis armqone mkvlevari, 7 _ doqtoranti, 1 – magistranti.

samecniero-kvleviTi muSaobis Sedegebi aisaxa 69 gamoqveynebul samecniero naSromSi, romelTagan 20 gamoica impaqt-faqtoris mqone samecniero JurnalebSi (maT Soris 13 – gmi-is saxeliT), recenzirebad da referirebad samecniero JurnalebSi – 24 (maT Soris 11– gmi-is saxeliT), sxva samecniero JurnalebSi (an statiaTa krebulebSi) – 25 (ix. danarTi #3, gv.26-28).

gmi-Si funqcionirebs 3 saswavlo-samecniero laboratoria (ix. danarTi #4, gv.29-36), romelTa bazaze Tsu zusti da sabunebismetyvelo mecnierebebis fakultetis 351 studentma Seasrula laboratoriuli samuSaoebi.

Tsu-s 6 da stu-s 1 doqtorants xelmZRvanelobdnen gmi-Si dasaqmebuli mecnieri-mkvlevarebi.

gmi-s bazaze Catarda 7 samecniero Sekreba, romlebzec monawileTa Soris iyo 11 mecnieri sazRvargareTis 8 qveynidan. garda amisa, gmi_Si dasaqmebuli mecnieri-mkvlevarebi monawileobdnen 26 samecniero Sekrebis muSaobaSi – sul 31 mkvlevaris mier wakiTxul iqna 87 moxseneba (ix. danarTi #5, gv.37-39).

gmi-Si dasaqmebul mecnier-mkvlevarebs samuSao vizitebi hqondaT ucxoeTis samecniero centrebSi (ix. danarTi #6, gv.40).

SeniSvna. garda gmi-Si dasaqmebuli 36 mkvlevarisa, gmi-s bazaze samecniero-kvleviT muSaobas eweoda Tsu-s 2 emeritus-profesori da gmi-dan Tsu-Si konkursis wesiT arCeuli 10 profesori (ix. danarTi #7, gv.41). maTi samecniero aqtivobis Sesaxeb informacia mocemulia Tsu-s akademiuri personalis samecniero aqtivobis gamosavleni kiTxvaris individualur pasuxebSi.

1.1. i. vekuas saxelobis gamoyenebiTi maTematikis institutis samecniero proeqtebi

#	proeqtis dasaxeleba	proeqtis xelmZRvaneli	proeqtis damfinan-sebeli	proeqtis xangrZlivoba	proeqtis Ribuleba	maT Soris Tsu-s ericxeba zednadebi	Semsruleblebi	proeqtis (grantis) #	oTaxebis raod.
1	wesebze dafuZnebu-li dapro-grameba mimdevrobi-Ti da maRali rigis cvladebiT	jemal anTiZe	saqarTve-los naciona-luri samecniero fondi	22.01.2010-21.01/2011	48667	10%	1.bogveraZe giorgi 2.dundua beso 3.uridia levani	GNSF/ST 09_184_1-120	2
2	elifsuri sistemebi rimanis zedapirebze	grigor giorgaZe	sesf	24 Tve (22 ianvari 2010 _22 ian-vari 2012)	100 000 lari	10 000 lari	g. giorgaZe g. axalaia e. gordaZe g. maqacaria n. manjaviZe v. jiqia n. qaldani	GNSF/ 1-3/85	1
	navTobisa da	samecniero	saqarTvelos				ZiriTadi		

danarTi 1

#	proeqtis dasaxeleba	proeqtis xelmZRvanelebi	proeqtis damfinan-sebeli	proeqtis xangrZlivoba	proeqtis Rirebuleba	maT Soris Tsu-sericxeba zednadebi	Semsruleblebi	proeqtis (grantis) #	oTaxebis raod.
3	gazis milsadenebze eqstremaluri avariebisa da garemos SesaZlo gaWyWyianebis risk faqtorebis Sefaseba maTematikuri modelirebiT	xelmZRvanelebi: daviT gordeziani; menejeri: Teimuraz daviTaSvili	erovnuli samecniero fondi	2010-2011	90255	8205	**Semsruleblebi:** daviT gordeziani; Teimuraz daviTaSvili; giorgi gelaZe; arCil papukaSvili; inga samxaraZe **damxmare** **Semsruleblebi:** meri SariqaZe; nino sadraZe; nana dixaminjia;	GNSF/ST 09-614-5-210	1

#	proeqtis dasaxeleba	proeqtis xelmZRvaneli	proeqtis damfinan-sebeli	proeqtis xangrZlivoba	proeqtis Rirebuleba	maT Soris Tsu-sericxeba zednadebi	Semsruleblebi	proeqtis (grantis) #	oTaxebis raod.
4	sawyisi monacemebis optimizacia da Sebrunebuli amocanebi zogierTi klasis funcionalur diferencia-luri gantolebebi-saTvis	Tamaz TadumaZe	sesf	24 Tve (marti 2009-marti 2011)	74, 100. 00 lari	7,410. 00 lari	Semsruleblebi: T. TadumaZe, a. arsenaSvili	**GNSF/ST 08/3-399**	1
5	dedamiwis ionosferoSi rosbisa da aukstikur-gravitaciuli eleqtromagni-turi talRebis gavrcelebis dinamikis fizikuri modelireba	Tamaz kalaZe	sesf	36 Tve 2009- 2011	114,240.00 lari	10,440.00 lari	1. Tamaz kalaZe 2. luba wamalaSvili 3. meri SariqaZe	GNSF/ST 08/5-442	1

#	proeqtis dasaxeleba	proeqtis xelmZRvaneli	proeqtis damfinan-sebeli	proeqtis xangrZlivoba	proeqtis Ribuleba	maT Soris Tsu-sericxeba zednadebi	Semsruleblebi	proeqtis (grantis) #	oTaxebis raod.
6	TiTqmis wrfivi da arsebiTad arawrfivi funqcionalur-diferencialur gantolebaTa amonaxsnebis asimptoturi yofaqcevis Sesaxeb	roman koplataZe	saqarTve-los erovnuli samecniero fondi (ssip)	ori weli	77100 (samocda-Cvidmeti aTas asi)	7700 (Svidi aTas Svidasi)	roman koplataZe gia kvinikaZe menejeri akaki arsenaSvili	GNSF/ST 09-81-3-101	

	proeqtis dasaxeleba	proeqtis xelmZRvanelebi	proeqtis damfinan-sebeli	proeqtis xangrZlivoba	proeqtis Rirebuleba	maT Soris Tsu-sericxeba zednadebi	Semsruleblebi	proeqtis (grantis) #	oTaxebis raod.
7	stoqasturi analizisa da statistikuri gadawyveti-lebebis zogierTi konstruqcia	grigol soxaZe	sesf	24 Tve	97113	10%	elizbar nadaraia besarion doWviri omar furTuxia	09-383-3-106	2
8	sxvadasxva fizikuri velis zemoqmedebis Seswavla periodul da kvaziperio-dul struqtu-rebze	nino xatiaSvili	sesf	36 Tve (2009 –2011)	147,300.00 lari	14,730.00 lari	saqarTvelos jgufis wevrebi: 1. n. xatiaSvili 2. r. saniZe 3. o.qomurjiSvili 4. a. papukaSvili 5. v axobaZe 6. T. maqacaria 7. q. firumova 8. z. kuWava 9. J. bolqvaZe 10. m. TevdoraZe	GNSF/ST 08/3-395	2

proeqtis damfinansebeli	proeqtebis raodenoba	mTliani mocauloba	zednadebi
sesf	8	748 775 lari	73 062 lari

garda amisa, mecnier-mkvlevarebs T. kalaZes da d. natroSvils mopovebuli hqondaT sesf-is moklevadiani samogzauro grantebi.

CamoTvlil proeqtebSi dasaqmebuli 41 Semsrulebelidan 12 institutSi SromiTi xelSekrulebis safuZvelze momuSavea.

1.2. SoTaA rusTavelis erovnuli samecniero fondi proeqti # 09_184_1_120

proeqtis dasaxeleba:
wesebze dafuZnebuli daprogrameba mimdevrobiTi da meore rigis cvladebiT

proeqtis xelmZRvaneli: __jemal anTiZe

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti, i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 24 Tve (ianvari, 2010 _ ianvari, 2012)

proeqtis ZiriTadi personali:
1. g. bogveraZe
2. b. dundua
3. l. uridia

2010 wlis mokle samecniero angariSi

proeqtis mizania, erTi mxriv, ρ-logis aRricxvis gafarToeba meore rigis iseT Termebze samuSaod, romlebic mimdevrobiT cvladebs Seicaven, da meore mxriv, gafarToebuli aRricxvis prototipuli realizacia. ρ-logis gafarToebuli aRricxvis klauzebi arian pirobiTi gadaweris wesebi strategiebiT da regularuli SezRudvebiT, romlebic moqmedeben meore rigis Termebze mimdevrobiTi cvladebiT. proeqtis miznis misaRwevad ganxorcielda:
Sesabamisobis gantolebaTa sistemis amoxsnis algoriTmis SemuSaveba meore rigis TermebisTvis, romlebic mimdevrobiT cvladebs Seicaven.
miRebuli algoriTmis gafarToeba Sesabamisobis iseTi sistemebis amosax-snelad, romlebSic zogierTi meore rigis cvladi SezRudulia regularuli xis gamosaxulebiT, zogierTi mimdevrobiTi cvladi ki regularuli mimdevrobis gamosaxulebiT.
miRebuli algoriTmis da misi gafarToebis Cadgma ρ-logis aRricxvaSi da Sedegad miRebuli gafarToebuli aRricxvis semantikis Seswavla.
ρ-logis gafarToebuli aRricxvis prototipuli realizacia.
ρ-logis gafarToebuli aRricxvis SesaZleblobebis Seswavla logikur CarCo-struqturad gamoyenebisTvis da XMmiznebis gamosaxvisTvis. sistema testirebulia sxvadasxva magaliTebiT.

1.3. SoTa rusTaveli erovnuli samecniero fondi
proeqti # 09_783_3_100

proeqtis dasaxeleba:
elifsuri sistemebi rimanis zedapirebze

proeqtis xelmZRvaneli: grigor giorgaZe

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti,
i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 24 Tve (ianvari, 2010 _ ianvari, 2012)

proeqtis ZiriTadi personali:
g. axalaia
e. gordaZe
n. manjaviZe
g. maqacaria
n. qaldani
v. jiqia

2010 wlis mokle samecniero angariSi

Seswavlil iqna araregularuli bers–vekuas gantolebis amonaxsenTa sivrce. damtkicda dolbos Teoremis analogi kompleqsur sibrtyeze lokalurad integrebad funqciaTa sivrcisaTvis. Semotanil iqna specialuri funqcionaluri sivrceebi da Seswavlil iqna Sesabamisi bers-vekuas gantolebis amonaxsenTa sivreebis damokidebuleba araregularul koeficientebze. agebul iqna bers-vekuas gantolebaTa sistemis magaliTi, romlis amonaxsnisaTvis ar sruldeba klasikur kompleqsur analizSi kargad cnobili maqsimumis principi. fsevdoanalizuri funqciebis maRali rigis warmoebulebis gamoyenebiT damtkicda fsevdoanalizuri funqciis piuzos mwkrivad gaSlis SesaZlebloba ganStoebis wertilis midamoSi. damtkicebul iqna liuvilis tipis Teoremebi araregularuli gantolebebisaTvis.

1.4. SoTa rusTavelis erovnuli samecniero fondi proeqti # 09_614/5_210

proeqtis dasaxeleba:
navTobisa da gazis milsadenebze eqstremaluri avariebisa da garemos SesaZlo gaWuWyianebis risk faqtorebis Sefaseba maTematikuri modelirebiT

proeqtis xelmZRvaneli: daviT gordeziani

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti, i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 24 Tve (ianvari, 2010 _ ianvari, 2012)

proeqtis ZiriTadi personali:
g. gelaZe
T. daviTaSvili
a. papukaSvili
i. samxaraZe

2010 wlis mokle samecniero angariSi

xorcieldeba iseTi sakvlevi, sainformacio da saprognozo programuli sistemebis Seqmna, romlebic saSualebas mogvcems Seviswavloт gazisa da navTob-sadenebis usafrTxoebis sakiTxebi, operatiulad aRmovaCinoT gazisa da navTobis gaJonvis koordinatebi, niadagsa da zRvaSi daRvrili navTobis difuziisa da gavrcelebis tendeciebi da viwinaswarmetyveloT SesaZlo ekologiuri situaciebi saqrTvelos teritoriis gaWuWyianebis Semsubuqebis mizniT. programuli sistemebi aseve saSualebas mogvcems vakontroloT rogorc globaluri gazuri magistralebi (baqo-Tbilisi-jeihani; mozdoki-Tbilisi-erevani; Cmi-saguramo; samxreT kavkasiis), ise lokaluri, Sida saqalaqo qselebi.

1.5. SoTa rusTavelis erovnuli samecniero fondi proeqti # 08/3_399

proeqtis dasaxeleba:
sawyisi monacemebis optimizacia da Sebrunebuli amocanebi zogierTi klasis funqcionalur-diferencialuri gantolebebisTvis

proeqtis xelmZRvanelი: Tamaz TadumaZe

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti,
i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 24 Tve (marti, 2009 – marti, 2011)

proeqtis ZiriTadi personali:
a. arsenaSvili

2010 wlis mokle samecniero angariSi

dagvianebul argumentiani da kvazi-wrfivi neitraluri optimaluri amocanebisTvis, romlebic bunebrivad warmoiSvebian Sebrunebuli amocanebis Seswavlisas, miRebulia sawyisi monacemebis (sawyisi funqcia, dagvianebis parametri, sawyisi momenti, sawyisi veqtori) optimalurobis aucilebeli pirobebi. wrfivi dagvianebul argumentiani erTi klasis optimaluri amocanisTvis SemoTavazebulia optimaluri sawyisi funqciis miaxloebiT moZebnis algoriTmi. damtkicebulia algoriTmis krebadoba. ganxilulia sailustracio magaliTi.

1.6. SoTa rusTavelis erovnuli samecniero fondi proeqti # 08/5_442

proeqtis dasaxeleba:
dedamiwis ionosferoSi rosbisa da akustikur-gravitaciuli eleqtromagnituri talRebis gavrcelebis dinamikis fizikuri modelireba

proeqtis xelmZRvanelis: Tamaz kalaZe

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti, i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 36 Tve (marti, .2009 – marti, .2012)

proeqtis ZiriTadi personali:
l. wamalaSvili

2010 wlis mokle samecniero angariSi

Catarebulia yvela saWiro gamoTvla rosbis tipis planetaruli eleqtromagnituri talRebis gamosakvlevad dedamiwis ionosferos EEda F SreebisaTvis. miRebulia talRuri rxevebis axali Sto, romelic ganpirobebulia dedamiwis magnituri velis sivrculi araerTgavrovnebiT. miRebulia Sesabamisi arawrfivi gantolebebis sistema, romlis gamoyenebiT Catarebulia aseTi talRebiT dedamiwis ionosferoSi zonaluri nakadis aRZvris SesaZlebloba.

eleqtromagnituri bunebis ultradabali sixSiris planetaruli masStabis (1000 km-ze meti) talRebi eqsperimentulad dakvirvebadia. maTi Teoriuli Sesabamisobis mizniT Cvens mier Seswavlil iqna rosbis tipis eleqtromagni-turi talRebis ionosferos EE-SreSi gavrcelebis SesaZ-ebloba. fizikuri modelirebis bazaze miRebul iqna aseTi talRebis gavrcelebis dinamikis aRmweri arawrfivi diferencialuri gantolebebi. miRebulia eqsperimentTan Sesabamisi Teoriuli Sedegebi.

Uultradabali sixSiris rosbis tipis planetaruli eleqtromagnituri talRebis gavrceleba dedamiwis ionosferos F - SreSi eqsperimenta-lurad dakvirvebadia. Aamitom am talRebis Teoriuli bazisis Sesaqmnelad eqsperimentuli monacemebis gaTvaliswinebiT Cvens mier agebul iqna Sesabamisi fizikuri modeli da Sedgenil iqna maTi gavrcelebis dinamikis aRmweri arawrfivi diferencialur gantolebaTa sistema. Mmimdinareobda am sistemis ricxviTi da analizuri kvleva.

1.7. SoTa rusTavelis erovnuli samecniero fondi proeqti # 09_81_3_101

proeqtis dasaxeleba:
TiTqmis wrfivi da arsebiTad arawrfivi funqcionalur-diferencialur gantolebaTa amonaxsnebis asimptoturi yofaqcevis Sesaxeb

proeqtis xelmZRvanelebi: roman koplataZe

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti,
i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 24 Tve (ianvari, 2010 – ianvari, 2012)

proeqtis ZiriTadi personali:
a. arsenaSvili
g. kvinikaZe

2010 wlis mokle samecniero angariSi

Seswavlil iqna dagvianebul argumentiani diferencialur gantolebaTa amonaxsnebis specifiuri Tvisebebi, romlebic ar gaaCnia Cveulebriv diferencialur gantolebebs. garda amisa, sxvaobiani gantolebebisaTvis Seswavlil iqna dadebiTi amonaxsnis arsebobis sakiTxi. Ddamtkicebulia ramdenime saWiro lema emden-fauleris ganzogadoebuli diferencialuri gantolebis Sesaswavlad.

1.8. SoTa rusTavelis erovnuli samecniero fondi proeqti # 09_383_3_106

proeqtis dasaxeleba:
stoqasturi analizisa da statistikuri gadawyvetilebebis zogierTi konstruqcia

proeqtis xelmZRvanelebi: grigor soxaZe

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti,
i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 24 Tve (ianvari, 2010 – ianvari, 2012)

proeqtis ZiriTadi personali:
b. doWviri
e. nadaraia
o. furTuxia

2010 wlis mokle samecniero angariSi

miRebulia statistikuri Sefasebebi iseTi SemTxveviTi sidideebis ganawilebebisaTvis, romlebzedac pirdapiri dakvirvebebi ar mimdinareobs. dawvrilebiT ganxilulia ori SesaZlo varianti: rodesac dakvirvebas eqvemdebareba mxolod SemTxveviTi sididis dadgoma/ardadgomis sakiTxi (e.w. bernulis sqema) da rodesac dakvirvebas vaxerxebT dinamiuri procesis mxolod bolo wertilSi da gvainteresebs ganawileba am dinamikis sawyis wertilSi.

1.9. SoTa rusTavelis erovnuli samecniero fondi proeqti # 08/3_395

proeqtis dasaxeleba:
sxvadasxva fizikuri velis zemoqmedebis Seswavla periodul da kvaziperiodul struqturebze

proeqtis xelmZRvaneli: nino xatiaSvili

wamyvani organizacia:
ivane javaxiSvilis saxelobis Tbilisis saxelmwifo universiteti, i. vekuas saxelobis gamoyenebiTi maTematikis instituti

proeqtis xangrZlivoba: 36 Tve (ianvari, 2009 –ianvari, 2012)

proeqtis ZiriTadi personali:

v. axobaZe
z. kuWava
T. maqacaria
a. papukaSvili
q. firumova
o. qomurjiSvili
r. saniZe

2010 wlis mokle samecniero angariSi

gamokvleul iqna Semdegi amocanebi:

konformul asaxvaTa da integralur gantolebaTa meTodebiT Seswavlil iqna stoqsis gantolebaTa sistema da turbulenturi difuziis gantoleba Sesabamisi sasazRvro pirobebiT, rac gamoyenebas poulobs adamianis organizmSi mimdinare zogierTi fiziologiuri procesis maTematikuri modelirebisas.

Seswavlil iqna Sredingeris samganzomilebiani gantoleba oqrosa da naxSirbadis nanostruqturebisTvis. miRebulia zusti amonaxsnebi.

(gverdebi 16 _25)

gmi_Si samecniero-kvleviTi muSaoba 2010 wlis manZilze mimdinareobda oTxi ZiriTadi mimarTulebiT

mimarTuleba 1. uwyvet garemoTa meqanikis maTematikuri problemebi da analizis monaTesave sakiTxebi (xelmZRvaneli – giorgi jaiani). muSavdeboda 15 individualuri samecniero-kvleviTi Tema.

Tema 1.1. ierarqiuli modelebis ageba bi-modularuli masalebisaTvis (Semsrulebeli – giorgi jaiani).

miRebuli Sedegi. ganzomilebis reduqciis meTodis gamoyenebiT agebulia ierarqiuli modelebi bi-modularuli prizmuli ReroebisaTvis.

Tema 1.2. drekad narevTa Teoriis statikis sasazRvro-sakontaqto amocanebis gamokvleva (Semsrulebeli - mixeil baSeleiSvili).

miRebuli Sedegi. ganxilulia sami are: sasruli D_1 are, romelic Sevsebulia drekadi nareviT da SemosazRvrulia S_1 wiriT, D_0 are, romelic agreTve Sevsebulia drekadi nareviT da SemosazRvrulia S_1 da S_0 wirebiT, mesame D_2 are, romelic agreTve Sevsebulia drekadi nareviT da SemosazRvrulia S_2 da S_0 wirebiT. GSeswavlilia amocana: moiZebnos sasazRvro-sakontaqto amocanis amonaxsni , romelic akmayofilebs sasazRvro pirobebs

$(U^{(1)})^+ = F^+$, an $(T^{(0)}U^{(0)})^+ = F^{(1)}$,

da sakontaqto pirobebs

$(U^{(1)})^+ - (U^{(0)})^- = F$, $(T^{(1)}U^{(1)})^+ - (T^{(0)}U^{(0)})^- = F^{(1)}$,

A damtkicebulia erTaderTobis Teoremebi da Sedgenilia fredholmis meore gvaris integraluri gantolebebi. Ddamtkicebulia am integralur gantolebaTa amonaxsnis arsebobis Teoremebi.

Tema 1.3. drekadobis brtyeli Teoriis nawilobriv ucnobsazRvriani amocanebis gamokvleva specialuri areebis SemTxvevaSi (Semsrulebeli – giorgi kapanaZe).

miRebuli Sedegi. ganxilulia drekadobis brtyeli Teoriis nawilobriv ucnobsazRvriani amocanebi, romelTa gamokvlevis ZiriTad maTematikur aparatad gamoyenebulia kompleqsuri analizis meTodebi, kerZod, konformul asaxvaTa da analizur funqciaTa sasazRvro amocanebis meTodebi. miRweulia kvlevis mizani _ ganxiluli amocanebis amonaxsnebis efeqturad (analizuri saxiT) warmodgena.

Tema 1.4. arawrfivi diskretuli gantolebis amonaxsnebis oscilaciuri Tvisebebis gamokvleva (Semsrulebeli _ roman koplataZe).

miRebuli Sedegi. Seswavlil iqna emden-fauleris ganzogadoebuli diferencialuri gantolebis amonaxsnebis asimptoturi yofaqceva. miRebuli Sedegebi warmoadgenen klasikuri emden-fauleris gantolebis SemTxvevaSic ki adre kargad cnobili Sedegebis arsebiT ganzogadoebas. garda amisa, miRebulia ganzogadoebuli gantolebis SemTxvevaSi specifiuri saxis Sedegebi, romlebsac adgili ar aqvs klasikuri gantolebis SemTxvevaSi. wrfivi dagvianebuli argumentebiani gantolebebisaTvis damtkicebulia dadebiTi amonaxsnis arsebobis aucilebeli pirobebi. garda amisa, dadgenilia rxevadi amonaxsnebis arsebobis optimaluri sakmarisi pirobebi.

Seswavlilia meore rigis arawrfivi sxvaobiani (diskretuli) gantolebebis amonaxsnebis asimptoturi yofaqceva. miRebulia adre cnobili Sedegebidan arsebiTad gansxvavebuli tipis Sedegebi.

Tema 1.5. arawrfivi da aradamreci garsebis gantolebaTa organzomilebiani sruli sistemis nebismieri rigis miaxloebisaTvis vekua-biwaZis kompleqsuri warmodgenis saSualebiT agebuli zogadi amonaxsnis gamoyenebiT ZiriTadi sasazRvro amocanebis gamokvleva specialuri geometriis mqone garsebis SemTxvevaSi (Semsrulebeli – Tengiz meunargia).

miRebuli Sedegi. ganxilul iqna kirSis cnobili amocana, romelic exeba drekad sxeulebSi xvrelebis garSemo Zabvebis koncentraciis sakiTxs. am amocanis amosaxsnelad gamoyenebul iqna i. vekuas mier SemoTavazebuli garsebisa da firfitebis ori sxvadasxva variantis dazustebuli da reisner-mindlinis tipis dazustebuli Teoriebi. miRebuli Sedegebi Sedarebulia, rogorc kirhgof-liavis klasikuri TeoriiT miRebul SedegebTan, aseve i. vekuas Teoriis orive variantiT miRebul SedegebTan.

Tema 1.6. prizmuli drekadi garsebisa da siTxis urTierTqmedebis maTematikuri problemebis gamokvleva.

piezokeramikuli kompozituri sxeulebis maTematikuri problemebis gamokvleva (Semsrulebeli – daviT natroSvili).

miRebuli Sedegi. Seswavlilia myari drekadi sxeulisa da siTxis urTirTqmedebis dinamikis amocanebi. damtkicebulia erTaderTobisa da arsebobis Teoremebi laplasis gardaqmnisa da laqs-milgramis Teoremis gamoyenebiT. Seswavlilia maTematikuri modeli, rodesac drekadi sxeuli warmoadgens Txeli prizmuli garsis formis CarTvas. am SemTxvevaSi, drekad areSi gamoyenebulia i.vekuas Teoria drekadi velis aRsawerad, romlis saSualebiTac ZiriTadi sasazRvro-sakontaqto amocanis Seswavla daiyvaneba aralokaluri tipis sasazRvro amocanaze stoqsis sistemisaTvis Wrilis Semcveli aris SemTxvevaSi. damtkicebulia am aralokaluri tipis sasazRvro amocanis amonaxsnis erTaderTobisa da arsebobis Teoremebi.

gamokvleulia bzarebis Semcveli keramikul-metaluri (CM) tipis kompozitisaTvis sasazRvro-sakontaqto da bzaris tipis amocanebi. Sesabamisi amocanebi dayvanilia fsevdodiferencialur gantolebaTa sistemaze da Catarebulia am sistemis fredholmurobis gamokvleva. (CM) tipis kompozitisaTvis ZiriTadi sasazRvro-sakontaqto da bzaris tipis amocanebisaTvis damtkicebulia amonaxsnebis arsebobisa da erTaderTobis Teoremebi da dadgenilia amonaxsnebis sigluve, agreTve dadgenilia amonaxsnebis asimptoturi Tvisebebi gansakuTrebuli wirebis midamoSi. daTvlilia singularobis maCveneblebi da dadgenilia am maCveneblebis materialur mudmivebze damokidebuleba.

Tema 1.7 gamosxivebis gadatanis maTematikur TeoriasTan dakavSirebuli zogierTi amocanis gamokvleva (Semsrulebeli – dazmir Sulaia).

miRebuli Sedegi. ganxilulia specifikuri xasiaTis, martivi nulis Semcveli koeficientiani, integraluri gantoleba, romelic dakavSirebulia gadatanis Teoriis amocanebTan, saxeldobr gamWoli radiaciis problemasTan. Seswavlilia am gantolebis amoxsnadobis da amonaxsenis agebis sakiTxebi.

Tema 1.8. sawyis-sasazRvro amocanis gamokvleva meore rigis hiperboluri diferencialuri gantolebisaTvis rigis gadagvarebiT aris gverdiTi sazRvris nawilze (Semsrulebeli – sergo xaribegaSvili).

miRebuli Sedegi. gamokvleulia sawyis-sasazRvro amocana erTi meore rigis sivrciT organzomilebiani hiperboluri gantolebisaTvis rigis gadagvarebiT aris gverdiTi sazRvris nawilze, romelic miiReba wamaxvilebuli drekadi

firfitis rxeviTi procesis maTematikuri modelirebisas. dadgenilia pirobebi amocanis monacemebze, romlebic uzrunvelyofen amonaxsnis arsebobas da erTaderTobas.

Tema 1.9. uwyveti garemos meqanikis gamoyenebiTi xasiaTis araklasikuri amocanebis gamokvleva specialuri formis drekadi sxeulebisaTvis (Semsrulebeli – nuri xomasuriZe).

miRebuli Sedegi. ganxilulia drekadobis Teoriis zogierTi araklasikuri amocana, romelTa Seswavlaze dadis mravali mniSvnelovani praqtikuli interesis mqone amocana. xsenebuli amocanebis magaliTad SeiZleba ganvixiloT Semdegi: drekadi sxeulis SigniT mocemul zedapirze winaswar dasaxelebuli Zabvebis miReba sxeulis sasazRvro zedapirze sasazRvro pirobebis SerCevis saSualebiT.

Tema 1.10. kompleqsur ricxvTa velze ganxiluli polinomis zogierTi Tvisebis analizi (Semsrulebeli – nikoloz avazaSvili).

miRebuli Sedegi. kompleqsur ricxvTa velze ganxiluli n–uri rigis algebruli polinomisaTvis agebulia kompleqsuri sibrtyis nebismieri sasruli wertilidan am polinomis maqsimalurad daSorebul fesvamde manZilis gamoTvlis algoriTmi.

Tema 1.11. riman-hilbertis tipis wyvetili sasazRvro amocanebis gamokvleva ganzogadebuli koSi-lebegis integralebiT warmodgenad **Q** - holomorful veqtorTa klasebSi (Semsrulebeli – giorgi axalaia).

miRebuli Sedegi. kompleqsur sibrtyeze ganxilulia pirveli rigis elifsuri sistemebi, romlebic literaturaSi cnobilia rogorc beltramis ganzogadoebuli sistemebi da warmoadgenen b. boiarskis mier adre Seswavlili sistemebis ganzogadoebas. aRniSnuli sistemebis ganzogadoebul amonaxsnebs ganzogadoebuli **Q**- holomorfuli veqtorebi ewodebaT. agebulia ganzogadoebuli **Q**- holomorful veqtorTa klasebi, romlebic wyvetili sasazRvro amocanebis Seswavlis bunebriv klasebs warmoadgenen.

Tema 1.12. drekadobis Teoriis zogierTi konkretuli sasazRvro-sakontaqto amocanis ricxviTi amoxsna (Semsrulebeli – naTela ziraqaSvili).

miRebuli Sedegi. gamokvleulia uban-uban erTgvarovan, r radiusiani wriuli xvrelis mqone usasrulo drekad sxeulSi (xvrelis zedapiri daserilia radialuri bzarebiT) deformaciebis damokidebuleba sxeulis Semadgenel masalebze, r radiusis sidideze, bzarebis raodenobasa da sigrZeze. r radiusisa da bzarebis sigrZis zogierTi mniSvnelobisaTvis sasazRvro elementTa meTodiT miRebulia ricxviTi amonaxsnebi da agebulia saTanado grafikebi. Catarebulia miRebuli Sedegebis fizikuri da meqanikuri interpretacia. miRebuli Sedegebis gamoyeneba SesaZlebelia gvirabebis mSeneblobisas, agreTve manqanaTmSenebloba Si.

Tema 1.13. Termoelastostatikis ZiriTadi sasazRvro da sakontaqto amocanebis gamokvleva transversalurad izotropuli sibrtyisaTvis (Semsrulebeli – lamara biwaZe).

miRebuli Sedegi. ganxilulia Termoelastostatikis ZiriTadi sakontaqto amocana ubnobriv erTgvarovani sibrtyisaTvis. potencialTa meTodisa da singularul integralur gantolebaTa Teoriis gamoyenebiT dasmuli amocanis amonaxsni warmodgenilia cxadi saxiT (kvadraturebSi).

ganxilulia Termoelastostatikis pirveli sasazRvro amocana transversalurad izotropuli Termodrekadi sibrtyisaTvis mrudwiruli WrilebiT (Wrilis orive napirze mocemulia gadaadgilebis veqtoris da temperaturis zRvruli mniSvnelobebi). potencialTa meTodisa da singularul integralur gantolebaTa Teoriis gamoyenebiT dasmuli

amocanis amoxsna miyvania integraluri gantolebis amoxsnaze. damtkicebulia fredholmis Teoremebis samarTlianoba miRebuli integraluri gantolebisaTvis.

Tema 1.14 drekadi forovani wris wonasworobis ZiriTadi sasazRvro amocanebis amoxsna cxadi saxiT (Semsrulebeli – ivane cagareli).

miRebuli Sedegi. ganixilulia e.w. aifantisis konsolidaciis Teoriis sasazRvro amocanebi orgvari forovnebis mqone drekadi arisaTvis. aris yovel wertilSi moqmedebs ori saxis wneva _ siTxis wneva forebSi da siTxis wneva napralebSi (bzarebSi), forebsa da napralebs Soris siTxis mimocvlis procesis gaTvaliswinebiT. Camoyalibebulia amocanebi Semdegi sasazRvro pirobebiT: mocemulia gadaadgilebis (an Zabvis) veqtoris mniSvnelobebi da wnevaTa (an maTi normaluri mdgenelebis) mniSvnelobebi, Sesabamisad, forebsa da napralebSi. wrisaTvis, wris gare arisa da wriuli rgolisaTvis amoxsnilia foroelasto-statikis sasazRvro amocanebi. amonaxsnebi warmodgenilia absoluturad da Tanabrad krebadi mwkrivebis saxiT, rac sakvlevi amocanis ricxviTi analizis Catarebis saSualebas iZleva. Sedgenilia gamoTvlis programa da maTematikur gamoTvlaTa "MathCad" sistemis gamoyenebiT konkretuli monacemebisaTvis miRebulia ricxviTi Sedegebi.

Tema 1.15. drekadobisa da garsTa Teoriebis zogierTi sasazRvro amocanis analizuri amonaxsnebis ageba (Semsrulebeli – roman janjRava).

miRebuli Sedegi. gamokvleulia drekadobisa da garsTa Teoriis zogierTi praqtikuli xasiaTis sasazRvro amocana.

garda amisa, pirveli samecniero mimarTulebiT Tsu zusti da sabunebismetyvelo mecnierebebis fakultetis maTematikis departamentis doqtorantebi ikvlevdnen:

giorgi Todua (samecniero xelmZRvaneli g. jaiani) – Zelis rxevis amocanas Sereuli sasazRvro pirobebiT;

iusuf fuat giulveri (samecniero xelmZRvaneli g. jaiani) _ graduirebul safarTan bmuli Txeli firebis sakintaqto amocanebs.

valerian jiqia (samecniero xelmZRvanelebi g. giorgaZe, g. jaiani) _ karleman_vekuas erTi klasis araregularul diferencialur gantolebas, romlisTvisac miRebul iqna liuvilis tipis Teorema.

mimarTuleba 2. maTematikuri modelireba da gamoTvliTi maTematika (xelmZRvanelebi – daviT gordeziani, Tamaz vaSaymaZe). muSavdeboda 6 individualuri samecniero-kvleviTi Tema.

Tema 2.1. araerTgvarovan disipaciur ionosferul-plazmur garemoSi arawrfivi struqturebis generaciis da maTi Semdgomi dinamikis aRmweri fizikuri da maTematikuri modelebis Seqmna (Semsrulebeli – giorgi aburjania).

miRebuli Sedegi. gamokvleulia Zlierad lokalizebuli grigaluri struqturebis generaciisa da arawrfivi dinamikis Taviseburebani ionosferul, magnitoaqtiur nawilobriv-ionizebul araerTgvarovan disipaciur plazmaSi. miRebulia grZel-talRovani dreifuli talRuri struqturebis gadatanis arawrfivi gantoleba, romelic iTvaliswinebs garemos wonasworuli simkvrivisa da temperaturis sivrciT araerTgvarovnebas, magnitur da dajaxebiT siblantes da xaxuns. dinamikuri gantoleba Seicavs ori saxis arawrfivobas: ^skalarul arawrfivobas (ganpirobebuls temperaturis araerTgvarovnebiT) da veqtorul arawrfivobas

(ganpirobebuls garemos nawilakebis konveqciur-polarizaciuli moZraobiT). miRebuli gantoleba sivrciTi warmoebulis mimarT aris meoTxe rigis, gansxvavebiT adre miRebuli meore rigis xazegava-mimis gantolebisagan. napovnia am arawrfivi gantolebis zusti analizuri amonaxsni axali tipis Zlierad lokalizebuli stacionaruli grigaluri struqturebis saxiT. Catarebulia miRebuli arawrfivi dinamikuri gantolebis ricxviTi amoxsna. SemoTavazebulia misi ricxviTi amoxsnis axali algoriTmi da axali sasrul-sxvaobiani aracxadi sqema da damtkicebulia am amonaxsnis erTaderTobis Teorema. Aam gantolebis bazaze gamokvleulia gamovlenili stacionaruli grigalis arastacionaruli dinamika masze zemoTaRniSnuli faqtorebis zemoqmedebisas. ricxviTi modelirebis safuZvelze gamovlenilia, rom veqtoruli arawrfivoba TmaSobs orgvar rols _ exmareba dispersias anda skalarul arawrfivobas (maTi sididis da mixedviT) urTierT wonasworobis SenarCunebaSi da Sesabamisad, xels uwyobs ganmxoloebuli grigaluri struqturebis TviTorganizacias. naCvenebia, rom dispersia anawevrebs sawyis dipolur grigals SedarebiT mciremasStabiani, naklebad intensiuri da mWidrod ganawilebuli monopoluri grigalebis erTobliobad _ erTmaneTis miyolebiT ganlagebul ciklonebad da anticiklonebad. susti dispersiis pirobebSi sawyisi dipolis evoluciisas, skalaruli arawrfivoba simetriulad ganacalkevebs ciklon-anticiklonis wyvils da warmoiqmneba TiTqmis erTnairi intensivobis, formisa da zomis damoukidebeli cikloni da anticikloni. Ddispersiuli efeqtebis gazrdisas struqturebis gancalkeveba xdeba anizotropiuli: warmoqmnili anticikloni aris ufro intensiuri da lokalizebuli, xolo cikloni aris ufro susti da didmasStabiani. SemdgomSi cikloni SedarebiT didxans narCundeba, xolo anticikloni nawevrdeba mcire zomis grigalebad da disipacia ufro aCqarebs am process. Ggamovlenilia, rom blanti disipaciiT gamowveuli relaqsacia gansxvavdeba xaxunis ZaliT gamowveul grigalis milevis procesisagan. Ggrigalis milevis dro arsebiTad aris damokidebuli grigalis maxasiaTebel zomaze: didmasStabiani grigalebi ufro met xans cocxloben. naCvenebia, rom aramdgradobis arsebobisas sawyisi grigali Zlierdeba, xolo dipolis Semadgeneli wyvilis (ciklon-anticiklonis) sicocxlis xangrZlivoba izrdeba. droTa ganmavlobaSi sistemaSi generirdeba mciremasStabiani xmauri da SeSfoTebebis sivrciTi struqtura xdeba araregularuli. Gganmxoloebuli grigaluri struqturebis erTmaneTTan da garemosTan urTierTqmedebis dadgenili suraTi aCvenebs, rom araerTgvarovan plazmur garemoSi grigalur struqturebs SeuZliaT ganapirobon Zlieri dreifuli turbulentobis, nivTierebisa da siTbos anomaluri gadatanis formireba.

Tema 2.2. dedamiwis ionosferoSi rosbis tipis eleqtromagnituri talRebis zonalur qarTan arawrfivi urTierTqmedebis gamokvleva (Semsrulebeli – Tamaz kalaZes).

miRebuli Sedegi. Catarebulia sustad ionizirebul ionosferul plazmaSi rosbis tipis eleqtromagnituri talRebis arawrfivi urTierTqmedebis Sedegebis analizi.

Tema 2.3. samSriani naxevraddiskretuli sqemis mdgradobis da krebadobis sakiTxebis gamokvleva kirxofis tipis arawrfivi gantolebisaTvis (Semsrulebeli – jemal rogava).

miRebuli Sedegi. ganxilulia koSis amocana abstraqtuli hiperboluri gantolebisaTvis H hilbertis sivrceSi:

$$\frac{d^2u(t)}{dt^2}+Bu(t)+a\left(\left\|A^{1/2}u\right\|^2\right)Au(t)+M(u(t))=f(t), \tag{1}$$

$$u(0)=\varphi_0,\quad \frac{du(0)}{dt}=\varphi_1, \tag{2}$$

sadac A da B TviTSeuRlebuli dadebiTad gansazRvruli (zogadad SemousazRvreli) operatorebia $D(A)$ da $D(B)$ gansazRvris areebiT, romlebic yvelgan mkvrivia H-Si, amasTan sruldeba Semdegi pirobebi

$$\|Au\|^2\le c_0(Bu,u),\quad \forall u\in D(B)\subset D(A),\quad c_0=const>0,$$

sadac $a(s)=\lambda+s,\quad \lambda>0$; arawrfivi operatori $M(\cdot)$ akmayofilebs lipSicis pirobas; φ_0 da φ_1 mocemuli veqtorebia $D(A)$-dan; $u(t)$ uwyveti, orjer uwyvetad warmoebadi saZiebeli funqciaa mniSvnelobebiT H-Si da $f(t)$ mocemuli funciaa mniSvnelobebiT H-Si.

kirxofis Zelis gantolebis abstraqtuli analogi warmoadgens (1) gantolebis kerZo SemTxvevas.

(1) - (2) amocanis miaxloebiTi amonaxsni iZebneba Semdegi naxevraddiskretuli sqemiT:

$$\frac{u_{k+1}-2u_k+u_{k-1}}{\tau^2}+B\frac{u_{k+1}+u_{k-1}}{2}+a\left(\left\|A^{1/2}u_k\right\|^2\right)\frac{Au_{k+1}+Au_{k-1}}{2}+M(u_k)=f_k, \tag{3}$$

$$u_0=\varphi_0,\quad u_1=\varphi_0+\tau\varphi_1+\frac{\tau^2}{2}\varphi_2,\quad \varphi_2=f_0-M(\varphi_0)-B\varphi_0-a\left(\left\|A^{1/2}\varphi_0\right\|^2\right)A\varphi_0, \tag{4}$$

sadac $f_k=f(t_k),\quad k=1,2,...,n-1,\quad \tau=T/n\quad (n>1)$.

(1)-(2) amocanis miaxloebiTi amonaxsnad $t_k=k\tau$ wertilSi cxaddeba u_k.

$B=A^2$ SemTxvevisaTvis (3)-(4) sqemis ricxviT amoxsna ganxorcielebulia Semdegi algoriTmiT:

$$u_{k+1}=(I+\alpha_1\tau A)^{-1}(I+\alpha_2\tau A)^{-1}\varphi_k-u_{k-1},$$
$$\varphi_k=2u_k+\tau^2(f_k-M(u_k)),$$

sadac α_1 da α_2 parametrebi akmayofileben Semdeg gantolebebs:

$$\begin{cases}\alpha_1\alpha_2=1/2,\\ \alpha_1+\alpha_2=\tau\,a\left(\left\|A^{1/2}u_k\right\|^2\right)/2,\end{cases}$$

(3)-(4) sqemis krebadobis rigi aris $O(\tau^2)$. agebuli sqemis gamoyenebiT, Catarebulia ricxviTi gaTvlebi sxvadasxva modeluri amocanebisTvis. ricxviTi gaTvlebis Sedegebis safuZvelze Seswavlilia agebuli sqemis mdgradoba da krebadoba.

Tema 2.4 ionosferoSi araerTgvarovan zonalur qarTan urTierTqmedebisas ultradabali sixSiris eleqtromagnituri talRebis aramdgradobis kriteriumis dadgena (Semsrulebeli – xaTuna Cargazia).

miRebuli Sedegi. Seswavlilia planetaruli ultra-dabali sixSiris (uds) talRebis dinamika disipaciur ionosferoSi erTgvarovani zonaluri qarebis (wanacvlebiTi dinebebi) fonze. planetaruli uds eleqtromagnituri talRebi generirdebian garemosa da sivrciT araerTgvarovani geomagnituri velis urTierTqmedebis Sedegad. napovnia didmasStabiani damagnitebuli rosbis tipisa da mcire masStabiani inerciuli talRebis intensifikaciisa da urTierT transformaciis efeqturi wrfivi meqanizmi. am procesebis Sesaswavlad gamoyenebul iqna aramodaluri analizi, romelmac aCvena, rom

wanacvlebiT dinebebSi talRuri SeSfoTebebis transformacia gamowveulia amocanis sakuTari funqciebis araorTogonalurobiT wrfiv miaxloebaSi.

gamokvleulia didmasStabiani damagnitebuli rosbis tipis talRebis aramdgradobis piroba. aRniSnuli pirobis Sesrulebis areSi irRveva talRis wrfivi dinamika da SesaZlebeli xdeba arawrfivi procesebis ganviTareba. naCvenebia, rom dedamiwis atmosferoSi warmoiSveba zonaluri qaris iseTi SeSfoTeba, romlisTvisac garkveul rezonansul Sreze $y = y_r$ sruldeba modificirebuli releis piroba $V_0'' = |\alpha + \beta|$ (V_0 aris zonaluri qaris siCqare, α da β, Sesabamisad, geomagnituri velisa da dedamiwis brunvis kuTxuri siCqaris araerTgvarovnebebia). am pirobis Sesrulebisas zonaluri dineba kargavs aramdgradobis Tvisebas drois garkveul SualedSi, ris Semdeg dineba kvlav aRdgeba da procesi xdeba mdgradi.

Tema 2.5. dedamiwis ionosferoSi eleqtromagnituri talRebis gavrcelebis maTematikuri gamokvleva (Semsrulebeli – luba wamlaSvili).

miRebuli Sedegi. gamokvleulia dedamiwis miwisZvrebis Sedegad gaCenili gamosxivebis zemoqmedeba ionosferoSi gavrcelebad talRebze. agebul iqna sxdasxva maTematikuri modelebi, romlebic aRweren aseT urTierTqmedebas. aRmoCnda, rom zogierTi talRuri arawrfivi warmonaqmni SeiZleba ganxilul iqnas miwisZvrebis SesaZlo winamorbedad.

Tema 2.6. arawrfivi evoluciuri amocanisaTvis I _ IV rigebis sizustis mqone dekompoziciis sqemebis ageba, gamokvleva da maT safuZvelze kompiuteruli paketis Seqmna ricxviTi gaTvlebis Casatareblad (Semsrulebeli – mixeil wiklauri).

miRebuli Sedegi. ganxilulia Semdegi saxis kvaziwrfivi evoluciuri amocana:

$$u'(t) + Au(t) + M(u(t)) = f(t), \quad t > 0, \quad u(0) = \varphi. \tag{1}$$

aq A aris TviTSeuRlebuli dadebiTad gansazRvruli (zogadad SemousazRvreli) operatori H hilbertis sivrceSi da warmodgeba ori Sesakrebis jamis saxiT, sadac TiToeuli Sesakrebi aris TviTSeuRlebuli dadebiTad gansazRvruli operatori ($A = A_1 + A_2$), φ mocemuli elementia $D(A)$-dan, $f(t)$ aris uwveti da uwyvetad warmoebadi funqcia, arawrfivi operatori $M(\cdot)$ akmayofilebs lipSicis pirobas.

SemoRebulia Semdegi baduri simravle $\varpi_\tau = \{t_k = k\tau, \quad k = 0,1,...,\tau > 0\}$. (1) amocanis amonaxsnisaTvis samarTliania Semdegi formula:

$$u(t_{k+1}) = U(2\tau, A)u(t_{k-1}) + \int_{t_{k-1}}^{t_{k+1}} U(t_{k+1} - s, A)\tilde{f}(s, u(s))ds \tag{2}$$

sadac $U(t, A) = \exp(-tA), \quad \tilde{f}(s, u(s)) = f(s) - M(u(s))$.

(2) formulis safuZvelze agebulia Semdegi mesame rigis sizustis dekompoziciis sqema

$$u_{k+1} = V(2\tau)u_{k-1} + \frac{\tau}{3}\left(\tilde{f}(t_{k+1}, u_{k+1}) + 4V(\tau)\tilde{f}(t_k, u_k) + V(2\tau)\tilde{f}(t_{k-1}, u_{k-1})\right), \tag{3}$$

$$V(\tau)=T\left(\tau,\frac{\overline{\alpha}}{4}\right)\overline{T}\left(\tau,\frac{\overline{\alpha}}{4}\right)T\left(\tau,\frac{\alpha}{4}\right)\overline{T}\left(\tau,\frac{\alpha}{4}\right)T\left(\tau,\frac{\alpha}{4}\right)\overline{T}\left(\tau,\frac{\alpha}{4}\right)T\left(\tau,\frac{\overline{\alpha}}{4}\right)\overline{T}\left(\tau,\frac{\overline{\alpha}}{4}\right),$$

$$T(\tau,\alpha)=W(\tau,\alpha A_1)W(\tau,\alpha A_2)...W(\tau,\alpha A_m),$$

$$\overline{T}(\tau,\alpha)=W(\tau,\alpha A_m)W(\tau,\alpha A_{m-1})...W(\tau,\alpha A_1),$$

$$W(\tau,A)=\left(I-\frac{\alpha}{2}\tau A\right)\left(I+\frac{\alpha}{2}\tau A\right)^{-1}\left(I-\frac{\overline{\alpha}}{2}\tau A\right)\left(I+\frac{\overline{\alpha}}{2}\tau A\right)^{-1},\quad \alpha=\frac{1}{2}\pm i\frac{1}{2\sqrt{3}}.$$

(3) sqemis ricxviTi realizacia yovel t_{k+1} droiT Sreze xorcieldeba Semdegi iteraciuli procesiT:

$$u_{k+1}^{m}=-\frac{\tau}{3}M\left(u_{k+1}^{m-1}\right)+F_k,\quad k=1,2,...\quad m-\textit{iteration index}$$

$$F_k=V(2\tau)\left(u_{k-1}+\frac{\tau}{3}\tilde{f}(t_{k-1},u_{k-1})\right)+\frac{4\tau}{3}V(\tau)\tilde{f}(t_k,u_k)+\frac{\tau}{3}f(t_{k+1}).$$

gamokvleulia (3) sqemis mdgradoba da Sefasebulia miaxloebiTi amonaxsnis cdomileba. am sqemis gamoyenebiT Catarebulia ricxviTi gaTvlebi sxvadasxva moduluri amocanebisaTvis.

garda amisa, meore samecniero mimarTulebiT Tsu zusti da sabunebismetyvelo mecnierebebis fakultetis maTematikis departamentis doqtoranti nana dixaminjia (xelmZRvanelebi d. gordeziani, j. rogava) ikvlevda kvaziwrfiv evoluciur amocanas, romlisTvisac agebul iqna pirveli, meore, mesame da meoTxe rigis sizustis dekompoziciis sqemebi, rogorc ori, ise mravalganzomilebiani SemTxvevisaTvis. gamokvleul iqna am sqemebis mdgradobisa da krebadobis sakiTxebi. agebuli sqemebis safuZvelze Seqmnil iqna programuli uzrunvelyofa amocanebis ricxviTi gaTvlebisaTvis.

mimarTuleba 3. diskretuli maTematika da algoriTmebis Teoria (xelmZRvaneli – aleqsandre xaraziSvili). muSavdeboda 5 individualuri samecniero- kvleviTi Tema.

Tema 3.1. gamokvleva simravleTa Teoriisa da usasrulo kombinatorikis zogierTi sakiTxisa, romlebic dakavSirebulia sabaziso simravleSi garkveuli tipis kombinatoruli Tvisebebis mqone ojaxebis arsebobasTan da maT uSualo gamoyenebebTan maTematikis momijnave dargebSi (Semsrulebeli – aleqsandre xaraziSvili).

miRebuli ASedegi. ganxilulia evkliduri geometriis zogierTi kombinatoruli da simravlur-Teoriuli aspeqti. yoveli naturaluri k ricxvisaTvis Semotanilia k-erTgvarovani dafarvis cneba da Seswavlilia erTgvarovani dafarvebis sxvadasxva geometriuli da kombinatoruli Tviseba. kerZod, naCvenebia, rom roca k aranulovani luwi ricxvia, maSin efeqturad aigeba evkliduri sivrcis k-erTgvarovani dafarva wyvil-wyvilad kongruentuli wrewirebis meSveobiT, xolo 1-ze meti kenti k ricxvis SemTxvevaSi analogiuri dafarvis arseboba mtkicdeba arakonstruqciuli simravlur-Teoriuli meTodebis gamoyenebiT (saxeldobr, cermelos Teoremaze dayrdnobiT).

gamokvleulia mravali cvladis uwyveti funqciebis uban-uban afinuri funqciebiT aproqsimaciis zogierTi amocana, romelic uSualod ukavSirdeba e.w. geometriuli algoriTmebis sirTulis dadgenis sakiTxebs. damtkicebulia, rom, sazogadod aseTi aproqsimaciis struqtura aris arapolinomialuri sirTulis mqone (e.i. elementarul afinur SesakrebTa

raodenoba arapolinomialuri siCqariT izrdeba). dadgenilia am tipis amocanebis mWidro kavSiri geilis poliedrebis geometriul TvisebebTan.

damtkicebulia garkveuli tipis brtyeli simravleebis nulzomis kveTebis iseTi ojaxis arseboba, romelTa gaerTianeba arazomad simravles warmoadgens. zogierT damxmare simravlur-Teoriul hipoTezaze dayrdnobiT (magaliTad, martinis aqsiomis gamoyenebiT), es Sedegi ganzogadebulia zomadi sivrceebis sakmaod farTo klasisaTvis. agreTve mocemulia miRebuli Sedegis erTi gamoyeneba topologiur jgufTa TeoriaSi.

Tema 3.2. polonur sivrceebze gansazRvruli gadasvlis birTvebis zogierTi Tvisebis Seswavla maTematikuri logikis, simravleTa Teoriis , jgufTa Teoriis, usasrulo kombinatorikis da zomis Teoriis gamoyenebiT (Semsrulebeli – giorgi fanculaia).

miRebuli Sedegi. sakoordinato R^2 sibrtyis qvesimravleTa garkveul s-algebraze agebulia ori ara s-sasruli Zvrebis mimarT invariantuli zomis iseTi magaliTi, rom *ZFC* TeoriaSi es zomebi arian erTobliVad singularulebi maSin da mxolod maSin, rodesac marTebulia kontinuum hipoTeza. garda amisa, *ZF+DC* TeoriaSi agebulia uniformulad modificirebuli orTogonaluri gadasvlis birTvebis or magaliTi, ase rom, sakiTxi am gadasvlis birTvebis uniformulad orTogonalurad modificirebis Sesaxeb ar aris amoxsnadi aRniSnul TeoriaSi. am magaliTebis konstruqciebi aris arsebiTad gansxvavebuli d.fremlinis mier agebuli magaliTisagan. universalurad sruli orTogonalurobis terminebSi, gadasvlis birTvisaTvis mocemulia Zaldebuli Sefasebis arsebobisaTvis aucilebeli da sakmarisi piroba.

Tema 3.3. Sesabamisobis gantolebaTa sistemis amoxsnis algoriTmis SemuSaveba mimdevrobiTi cvladebis Semcveli meore rigis TermebisaTvis (Semsrulebeli – jemal anTiZe).

miRebuli Sedegi. Seqmnilia meore rigis mimdevrobiTcvladebiani Sesabamisobis gantolebaTa sistemis amoxsnis algoriTmi, romelic iTvlis sistemis amonaxsnTa srul da minimalur simravles. Termebis gafarToeba mimdevrobiTi cvladebiT iZleva moqnil meqanizms qveTermebis moZebnisas mocemuli Termis traversi gakeTdes rogorc vertikalurad (meore rigis cvladebis meSveobiT), ise horizontalurad (mimdevrobiTi cvladebis meSveobiT). algoriTmi gafarTovda meore rigis mimdevrobiTcvladebiani Sesabamisobis gantolebaTa sistemis amosaxsnelad, rodesac zogierTi meore rigis mimdevrobiTi cvladi SezRudulia regularuli gamosaxulebebiT. miRebuli algoriTmi iTvlis amonaxsnTa minimalur sistemas. ganxorcielda algoriTmis testireba.

Tema 3.4. Sesabamisobis gantolebaTa sistemis amoxsnis algoriTmis koreqtulobis damtkiceba (Semsrulebeli _ giorgi bogveraZe).

miRebuli Sedegi. ganxilul iqna algoriTmis gafarToebis SesaZlebloba regularuli SezRudvebis sistemis amosaxsnelad meore rigis da mimdevrobiTi cvladebisaTvis da ρ-logis aRricxvis gafarToebuli versiisaTvis, romelic muSaobs meore rigis Termebze mimdevrobiTi cvladebiT, strategiebze da regularul SezRudvebze. kerZod, gafarTovda maTematikaze dafuZnebuli ρ-log sistema, strategiebiT daWdevebuli pirobiTi gadaweris wesebiT. wesebSi Semavali meore rigis mimdevrobiTi cvladebi SezRudulia regularuli gamosaxulebebiT, rac iZleva arasasurveli Sedegebis filtraciis moqnil meqanizms. Seswavlil iqna

gafarToebuli ρ-log sistemis logikuri da operaciuli semantika. miRebuli gafarToeba gamoiyenebul iqna semantikuri qselebis damuSavebisTvis.

Tema 3.5. logikuri da simravlur-Teoriuli meTodebis saSualebiT brtyel algebrul da transcendentur wirTa Tvisebebis da invariantebis dadgena da maTi gamoyeneba diskretuli maTematikis amocanaTa garkveuli klasisaTvisM(Semsrulebeli _ Tengiz tetunaSvili).

miRebuli Sedegi. ganxilulia evkliduri geometriis sxvadasxva debulebebi, romlebic garkveuli azriT dualuria mazurkeviCis cnobili Teoremisa, romlis mixedviTac evklides sibrtyeze arsebobs wertilTa simravle, romelsac amave sibrtyeSi mdebare nebismieri wrfe kveTs zustad or wertilSi. moyvanili debulebebi Sedarebulia erTimeoresTan simravlur-Teoriuli TvalsazrisiT. kerZod, xazgasmulia amorCevis aqsiomis roli miRebuli Sedegebis damtkicebis procesSi.

garda amisa, mesame samecniero mimarTulebiT saqarTvelos teqnikuri universitetis informatikisa da marTvis sistemebis fakultetis doqtorant Tamar qasraSvilis (xelmZRvanelebi a. kirTaZe, a. xaraziSvili) mier dadgenil iqna, rom kombinatoruli da diskretuli geometriis klasikuri Sedegi, romlis mixedviTac Tu sibrtyeze wertilTa usasrulo simravlis yovel or wertils Soris manZili mTeli ricxvia, maSin isini erT wrfeze ganlagdebian, SeiZleba ganzogaddes mravalganzomilebiani evkliduri sivrcis SemTxevisaTvisac.

mimarTuleba 4. albaTobis Teoria da maTematikuri statistika (xelmZRvanelebi _ elizbar nadaraia, grigol soxaZe). muSavdeboda 2 individualuri samecniero – kvleviTi Tema.

Tema 4.1. zRvariTi Teoremebis gamokvleva SemTxveviTi sididis integraluri saxis funqcionalebis SefasebebisaTvis (Semsrulebeli – grigor soxaZe).

miRebuli Sedegi. miRebulia rozenblat-parzenis tipis statistikuri Sefasebebis Tvisebebi im SemTxevaSi, rodesac gamoyenebulia integrebadi wonebi; Seswavlilia statistikuri struqturebis Tvisebebi, romlebic dakavSirebulia sustad da Zlierad gancalebadobasTan; arapirdapiri dakvirvebebisaTvis Camoyalibebulia statistikuri Sefasebebis algoriTmi ; warmodgenilia statistikuri cnebebis usasrulo ganzomilebiani sivrceebisaTvis gadatanis principebi da miRebulia Sesabamisi mtkicebulebebi.

Tema 4.2. SemTxveviT sidideTa jamebisaTvis zRvariTi Teoremebisa da statistikuri Sefasebis Teoriis momijnave sakiTxebis ganxilva (Semsrulebeli – Tengiz ServaSiZe).

miRebuli Sedegi. pirobiT damoukidebeli dakvirvebebis erTi klasisaTvis miRebulia zRvariTi Teoremebi, romlebic aRweren simkvrivis gulovani Sefasebis asimptotur yofaqcevas.

garda amisa, meoTxe samecniero mimarTulebiT Tsu zusti da sabunebismetyvelo mecnierebebis fakultetis maTematikis departamentis doqtoranti aleqsandre tyeSelaSvili (xelmZRvanelebi e. nadaraia, g. soxaZe) ikvlevda SemTxveviTi zomebis zogierT Tvisebas da maTi gamoyenebis sakiTxebs diferencialuri gantolebebis amonaxsnebis Sefasebisas.

gmi_Si dasaqmebuli mecnieri-mkvlevarebis (maTi gvarebi xazgasmulia) 2010 wlis samecniero publikaciebi impaqt-faqtoris mqone (aRniSnulia * simboloTi) da referirebad gamocemebSi

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¿ ¿ ¿

gmi_Si funqcionirebs 3 saswavlo-samecniero laboratoria

4.1. uwyvet garemoTa meqanikis maTematikuri problemebis da analizis monaTesave sakiTxebis laboratoria

saStato ricxovneba Tanamdebobebis miTiTebiT

laboratoriis gamge – CinCalaZe natalia (საზოგადოებრივ საწყისებზე)
laboranti – gulua bakur

CarTulia Tu ara saswavlo procesSi (dadebiTi pasuxis SemTxvevaSi miuTiTeT jgufi, sagani, saaTebis raodenoba, jgufSi studentTa raodenoba)

n. CinCalaZe

2009-2010-წლის გაზაფხულის სემესტრი

- დიფერენციალური მოდელები; ბაკალავრიატი, 1 კურსი (სემინარი; ზუსტი და საბუნებისმეტყველო მეცნიერებათა ფაკულტეტი)
- კალკულუსი 3-4-5 (ლექცია; ზუსტი და საბუნებისმეტყველო მეცნიერებათა ფაკულტეტი)
- gadagvarebuli kerZowarmoebuliani diferencialuri gantolebebis Teoria, მაგისტრატურა (სემინარი; ზუსტი და საბუნებისმეტყველო მეცნიერებათა ფაკულტეტი)

2010-2011-წლის შემოდგომის სემესტრი

- კალკულუსი 3-4-5; ბაკალავრიატი, 1 კურსი (ლექცია, პრაქტიკუმი)
- მათემატიკა ეკონომისტებისათვის; ბაკალავრიატი, 1 კურსი (სემინარი)

b. gulua

2009-2010-წლის გაზაფხულის სემესტრი

- კალკულუსი 1-2; ბაკალავრიატი, 1 კურსი (პრაქტიკუმი)
- wrfivi algebra da analizuri geometria; ბაკალავრიატი, 1 კურსი (პრაქტიკუმი)

2010-2011-წლის შემოდგომის სემესტრი

- კალკულუსი 3-4-5; ბაკალავრიატი, 1 კურსი (პრაქტიკუმი)
- wrfivi algebra da analizuri geometria; ბაკალავრიატი, 1 კურსი (პრაქტიკუმი)

leqciebis Semdeg studentebTan muSaoba

2009/2010 saswavlo wlis meore semestrSi laboratoriuli samuSaoebi Catarda Semdeg disciplinebSi

- diferencialuri modelebi biologiasa da qimiaSi (biologiis da qimiis mimarTulebis bakalavriati, 10 სტუდენტი)
- კალკულუსი 3-4-5 (28 სტუდენტი)

2010/2011 saswavlo wlis pirveli semestrSi laboratoriuli samuSaoebi Catarda Semdeg disciplinebSi

- kalkulusi sabunebismetyvelo mecnierebebisaTvis (fizikis, qimiis, biologiis, geografiis da geologiis mimarTulebis bakalavriati, 78 studenti)

TiToeuli TanamSromlis mier Sesrulebuli samuSao

მაღალრეიტინგულ (იმპაქტ-ფაქტორის მქონე) სამეცნიერო ჟურნალებში გამოქვეყნებული (გამოსაქვეყნებლად გადაცემული) ნაშრომები

1. N. Chinchaladze. Cusped Elastic Beams under the Action of Stresses and Concentrated Forces. Applicable Analysis, Volume 89, No. 5, 757–774, 2010 (with Jaiani, G.; Gilbert, R. P.; Kharibegashvili, S.; Natroshvili, D.), access: http://www.tandf.co.uk/journals

1. N. Chinchaladze. Concentrated contact interactions in cuspidate prismatic shell-like bodies. Archive of Applied Mechanics (with Jaiani, G.; Maistrenko B., P. P.-Guidugli), მიღებულია გამოსაქვეყნებლად

2. N. Chinchaladze. CYLINDRICAL VIBRATION OF CUSPED REISNER-MINDLIN PLATES. Proceedings of the 8th AIMS Conference (May 25-28, Dresden, Germany), AIMS' Journals, მიღებულია გამოსაქვეყნებლად.

საერთაშორისო რეფერირებად, რეცენზირებად სამეცნიერო ჟურნალებში, სამეცნიერო კონფერენციის სრულ მოხსენებათა კრებულებში (proceedings) გამოქვეყნებული შრომები

N. ChinCalaZe. Big deflections of the cusped plate under the Combined Action of Uniform Transverse Load and Uniform Tension. Proceedings of the International Scientific-Technical Conference (June 15-17, 2010, Tbilisi) "Civil Engineering Mechanics Actual Problems" in Scientific-Technical Journal "Building", No. 2 (17), 211-214, 2010

გამოსაქვეყნებლად მომზადებული შრომები:

1. B. Gulua. The Method of Normed Moments for the Non-Shallow Shells.

2. N. Chinchaladze. Solid-Fluid Interaction Dynamical Problems (with G. Jaiani, R.P. Gilbert, S. Kharibegashvili, D. Natroshvili)

საერთაშორისო სამეცნიერო კონფერენციებში, სემინარებში მონაწილეობა

1. ნ. ჩინჩალაძე. CYLINDRICAL VIBRATION OF CUSPED REISNER-MINDLIN PLATES. 8th AIMS Conference, May 25-28, 2010, Dresden, Germany
2. ნ. ჩინჩალაძე. Big deflections of the cusped plate under the Combined Action of Uniform Transverse Load and Uniform Tension. International Scientific-Technical Conference "Civil Engineering Mechanics Actual Problems", June 15-17, 2010, Tbilisi
3. ნ. ჩინჩალაძე. Incompressible Fluid-Cusped Plate Interaction Problem in Case of the Zero Approximation of I.Vekuas Hierarchical Models, First International Conference of Georgian Mathematical Union (September 12-19, 2010, Batumi, Georgia)
4. ნ. ჩინჩალაძე. "On Cusped Solid - Fluid Interaction Problems", in Seminar guided by Dr. Flavia Lanzara Dipartamento di Matematica-Istituto "Guido Castellnuovo", Universitá degli Studi di Roma "La Sapienza" (November 16, 2010 Italy)
5. ბ. გულუა. ნორმირებულ მომენტთა მეთოდის გამოყენება მუდმივი სისქის დრეკადი არადამრეცი გარსებისათვის. International Scientific-Technical Conference (June 15-17, 2010, Tbilisi)
6. ბ. გულუა. Application of the Method of Normed Moments for the Non-Shallow Shells, Book of Abstracts, First International Conference of Georgian Mathematical Union (September 12-19, 2010, Batumi, Georgia)

ადგილობრივ სამეცნიერო კონფერენციებში, სემინარებში მონაწილეობა

1. ნ. ჩინჩალაძე. ფირფიტების რხევის ამოცანა დიდი ჩაღუნვების შემთვევაში. ივ. ჯავახიშვილის სახელობის თბილისის სახელმწიფო უნივერსიტეტის ილია ვეკუას სახელობის გამოყენებითი მათემატიკის ინსტიტუტის სემინარის XXIV გაფართოებული სხდომები, 21-23 აპრილი, 2010, თბილისი
2. ნ. ჩინჩალაძე. წამახვილებული ფირფიტების რხევის ამოცანები დაზუსტებული თეორიის საფუძვლებზე. საქართველოს მექანიკოსთა კავშირის პირველი ყოველწლიური კონფერენცია, 20-23 დეკემბერი, 2010, თბილისი
3. ბ. გულუა. ნორმირებულ მომენტთა მეთოდი არადამრეცი გარსებისათვის. ივ. ჯავახიშვილის სახელობის თბილისის სახელმწიფო უნივერსიტეტის ილია ვეკუას სახელობის გამოყენებითი მათემატიკის ინსტიტუტის სემინარის XXIV გაფართოებული სხდომები, 21-23 აპრილი, 2010.
4. ბ. გულუა. ერთი შერეული სასაზღვრო ამოცანის შესახებ ი. ვეკუას არადამრეცი სფერული გარსებისათვის. ივ. ჯავახიშვილის სახელობის თბილისის სახელმწიფო უნივერსიტეტის ილია ვეკუას სახელობის გამოყენებითი მათემატიკის ინსტიტუტის სემინარის XXIV გაფართოებული სხდომები, 21-23 აპრილი, 2010.
5. ბ. გულუა. Non-shallow spherical shells. საქართველოს მექანიკოსთა კავშირის პირველი ყოველწლიური კონფერენცია, 20-23 დეკემბერი, 2010, თბილისი

damatebiTi informacia

- n. CinCalaZe, 2010 wlis axalgazrda mecnierTaTvis პრეზიდენტის გრანტის #2/3-08 მფლობელი (19.02-19.11.2010)

4.2. maTematikuri modelirebisa da gamoTvliTi maTematikis laboratoria

laboratoriis Semadgenloba:
Teimuraz daviTaSvili _ laboratoriis gamge;
meri SariqaZe _ ufrosi laboranti;
giorgi gelaZe _ laboranti.

კვლევის თემა: garemos dacva da ekologiis Tanamedrove problemebis Seswavla maTematikuri modelirebiT

კვლევაში ჩართული პერსონალი:
T. DdaviTaSvili, m. SariqaZe, g. gelaZe.

ჩატარებული samecniero სამუშაოს მოკლე რეზიუმე:

garemos dacva Tanamedroveobis erT-erTi yvelaze aqtualuri sakiTxia. warmoebis ganviTarebis zemaRalma tempma, energetikuli simZlavreebis ukontrolo da gauazrebelma zrdam migviyvana iseT Seuqcevad procesebTan, romlebmac gamoiwvies ekologiuri wonasworobis darRveva. amitom mavne nivTierebaTa sivrcul-droiTi ganawilebis analizi, maTi diagnostika da prognozireba Tanamedrove mecnierebis erT-erT ZiriTad amocanas warmoadgens. saangariSo wels Teoriuli kvlevebisa da maTematikuri da ricxviTi modelirebiT Seswavlil iqna: minarevTa atmosferoSi, niadagsa da hidrosferoSi gavrcelebis ZiriTadi kanonzomierebebi; mavne minarevTa gavrcelebis Taviseburebebi atmosferuli anomaliebis SemTxvevaSi; minarevTa gardaqmna da gavrcelebis Taviseburebebi rTuli orografiis SemTxvevaSi; radiaciuli da adveqciuri nisli, maTi prognozirebis sakiTxebi. nislisa da smogis gavlena atmosferoSi haeris gaWuWyianebis xarisxze. klimatis, aseve mikroklimatis ZiriTadi maxasiaTeblebis cvlilebis xasiaTi, maTi Taviseburebani, da maTze sxvadasxva faqtorebis gavlena; gansakuTrebiT anTropogenuri "saTburis efeqti"-is faqtoris gavlena klimatis cvlilebaze, rogorc globaluri, aseve regionalur masStabebiT. araerTgvarovan niadagze avariulad daRvrili navTobis niadagSi filtraciis amocana miwisqveSa wylebis gabinZurebis Seswavlis mizniT. gamokvlevebi eyrdnoba maRali rigis arawrfivi paraboluri tipis gantolebis integrebas.

samecniero პუბლიკაციები:

1. Davitashvili T.,G.Gubelidze, Samkharadze I., Leak Detection in Oil and Gas Transmission Pipelines, WSEAS Transactions on Environment and Development, WSEAS Transactions on Environmenta and Development, 2010,
2. Davitashvili T., Numerical Simulation of Environment Pollution for Some Regions of Georgia for Risk Assessment, WSEAS Transactions on Environment and Development, 2010
anotacia: naSromSi Seswavlilia saqarTvelos teritoriisTvis garemos (niadagi, miwispira da miwisqveSa wylebis) gabinZurebis amocana maTematikuri modelirebis saSualebiT. moyvanilia ricxviTi Tvlis Sedegebi.
3. Davitashvili T., Samkharadze I. On Oil Infiltration Problem Into Soil Spilled on the Non-homogeneous Surface of Soil. *Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics,(gadacemulia gamosaqveyneblad)*

4. Gubelidze G., Davitashvili T.—On Imitation Modelling of Oil and Gas Accidental Leakage at the Pipelines, . *Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics, (gadacemu l ia gamosaqveyneb l ad)*
5. Davitashvili T., Khantadze A., Kutaladze N. "On Droughts and Desertification Problems on the Territory of Georgia" *Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics, (gadacemu l ia gamosaqveyneb l ad* }
6.NKutaladze N., Mikuchadze G., Davitashvili T., "Weather Research Forecast Local Area Model Application for Georgia's Conditions", *Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics,* (gadacemu l ia gamosaqveyneb l ad).

saგრანტო samuSaos ფარგლებში ჩატარებული სამეცნიერო კვლევebi

გრანტის სათაური: navTobisa da gazis mi l sadenebze eqstrema l uri avariebisa da garemos SesaZ l o gaWuWyianebis risk faqtorebis Sefaseba maTematikuri mode l irebiT

ვადები: 2010-2011

ბიუჯეტი: 90255 l ari

შემსრულებლები: f.m.m.d./ prof. daviT gordeziani {samecniero xe l mZRvane l i};
f.m.m.d./ prof. Teimuraz DdaviTaSvi l i (mene jeri);
f.m.m.a.d. giorgi ge l aZe,
f.m.m.a.d arCi l paukaSvi l i;
Tsu-is doqtoranti inga samxaraZe;
Tsu-is ufrosi l aboranti meri SariqaZe

დამფინანსებელი (დონორი ორგანიზაცია, ფონდი): SoTa rusTave l iserovnu l i samecniero fondi

სამეცნიერო-კვლევითი სამუშაოების მოკლე ანგარიში:
amJamad, evro-kavSiris mier sxva partnior-qveynebTan erTad aqtiurad mimdinareobs muSaoba im proeqtebze romlebic miznad isaxaven evropis, kavkasiis da aziis damakavSirebe l i axa l i abreSumis gzis (TRACECA) kv l av aRorZinebas. centra l ur aziasa da Sav zRvas Soris damakavSirebe l satransporto qse l ebis ganviTarebis sakiTxSi saqarTve l o, Tavisi geopo l itikuri poziciis gamo, ganixi l ieba rogorc am programis erT-erTi aqtiuri wevri. navTobproduqtebis tranziti mniSvne l ovan po l itikur da ekonomikur mogebasTan erTad did zara l s ayenebs qveynebis eko l ogiur mdgomareobas. navTobproduqtebis transportireba iwvevs garemos gaWuWyianebas rogorc ordinaru l , aseve araordina l ur pirobebSi. araordina l ur pirobebs SeiZ l eba mivakuTvnoT iseTi SemTxvevebi, rogoric aris gauTva l iswinebe l i avariebi navTobsadenze, teroristu l i Tavdasxmebi, bunebrivi katak l izmebi (miwisZvrebi, Rvarcofebi, zvavebi) da sxva. orive SemTxvevaSi uaresdeba garemos eko l ogiuri mdgomareoba, rogorc avariis raionSi, aseve mezobe l regionebSi. proeqtis farg l ebSi saangariSo we l s SeviswavleT saqarTve l osaTvis metad aqtua l uri prob l ema-navTobisa da gazis mi l sadenebze eqstrema l uri avariebisa da garemos SesaZ l o gaWuWyianebis risk faqtorebis Seswav l a maTematikuri mode l irebiT, maTi Semamsubuqebe l i zomebisa da meTodebis SemuSavebis mizniT. kerZod: gaumjobesda da daixvewa arsebu l i maTematikuri da ricxviTi mode l ebi, rom l ebic aRweren niadagSi navTobis fi l traciis process navTobsadenebze avariis SemTxvevaSi; ganisazRvra mavne nivTierebaTa sivrcu l -droiTi ganawi l eba niadagSi navTobsadenebis gaswvriv arsebu l i ZiriTad niadagTa tipebisaTvis; Seswav l i l iqna meTodi, rome l ic saSua l ebas gvaZ l evs

aRmovaCinoT milsadenis dazianeba umcires drois periodSi da daRvrisa da gaJonvis adgilmdebareoba; SemuSavda Teoria, romlis saSualebiT Seswavlil iqna bzarebiT Sesustebuli Sedgenili sxeulebisaTvis drekadobis Teoriis antibrtyeli amocanebis amoxsna. kerZod Seswavlil iqna amonaxsnis yofaqcevis sakiTxebi bzaris boloebis maxloblobaSi. gamowerili iqna miaxloebiTi amoxsnis zogadi sqema kolokaciisa da speqtraluri meTodebis gamoyenebiT. Sedgenilia Sesabamisi ricxviTi algoriTmebi. Seswavlil iqna zRvaSi daRvrili navTobis gavrcelebis amocana maTematikuri modelirebiT.

მოხსენებები კონფერენციებზე:

1. Davitashvili T. "Assessment of risk factors of oil and gas pipelines damage and possible pollution of environment on the territory of Georgia." NATO Advanced Research Workshop on " Corrosion Protection of Pipelines Transporting Hydrocarbons" which you are going to held 26 - 28 Apr 2010, Biskra, Algeria
2. Davitashvili T. "Some Results of the Weather Forecasting Model WRF-ARW for Georgian Territory (GRID application)" SCSWT International conference, 28 October, 2010, Tbilisi, Georgia
3. Davitashvili T., Gordeziani D., Mathematical Modelling of Oil Penetration Into Soils" TICMI Advanced Courses on Boundary Value Problems for Partial Differential Equations, 23-24 June, 2010, Tbilisi,Georgia
4. Davitashvili T., Gordeziani D.,Mathematical Modelling of The Atmosphere Pollution With Non-Classic Boundary Conditions And Nesteed Greed Method" the 7th Conference on Numerical Methods and Applications - NM&A'10, August 20 - 24, 2010, Borovets, Bulgaria.
5. Davitashvili T., "Some features of climate change in some regions of Georgia and its impact on water resources" NATO Advanced Research Workshop (ARW) entitled "Effect of Climate Change on Water Supplies-Issues of National and Global Security" 01-04 September 2010 Çeşme, İzmir, Turkey
6. Davitashvili T., "Numerical Simulation of Environment Pollution for Some Regions of Georgia for Risk Assessment" WSEAS International Conference on ENVIRONMENT, ECOSYSTEMS and DEVELOPMENT (EED'10), Greece, December 29-31, 2010.
7. Davitashvili T., Gubelidze G., Samkharadze I. "Leak detection in oil amd gas transmission pipelines" WSEAS International Conference on ENVIRONMENT, ECOSYSTEMS and DEVELOPMENT (EED'10), Greece, December 29-31, 2010.
8. Davitashvili T., Kutaladze N.,.Kvatadze R, "Numerical Weather Prediction Over Caucasus Region With Nested Grid Models" 10th Annual Meeting of the European Meteorological Society (EMS) and the 8th European Conference on Applied Climatology (ECAC). These meetings will take place 13 – 17 September 2010 in Zürich, Switzerland.
9. Davitashvili Teimuraz, Gordeziani David, Samkharadze Inga, Papukashvili Archil Numerical Modeling of Oil Infiltration Into the Soil For Risk Assessment
10. Davitashvili Teimurazi, Gubelidze Givi, Samkharadze Inga Leak Detection in Oil and Gas Transmission Pipelines
11. gelaZe g., begaliSvili n., daviTaSvili T.D "zogierTi anomaluri mezoprocesis modelireba.'' saqarTvelos hidrometeorologiur institutis maisis 57-e samecniero sesiaSi " hidrometeorologiis problemebi: 2010w. 20-21 maisi.
12. gelaZe g., begaliSvili n., daviTaSvili T.D "atmosferos mezoprocesebSi siTburi talRis gavrcelebis Sesaxeb.'' saqarTvelos hidrometeorologiur institutis maisis 57-e samecniero sesia " hidrometeorologiis problemebi: 2010w. 20-21 maisi.
13. xvedeliZe z., daviTaSvili T., samxaraZe i. "mTagoriani teritoriis atmosferoSi mcire droSi didi simZlavris SeSfoTebebis gavrcelebis

Seswavla" saqarTvelos hidrometeorologiur institutis maisis 57-e samecniero sesia " hidrometeorologiis problemebi: 2010w. 20-21 maisi.

14. gubeliZe g., daviTaSvili T. _ navTobisa da gazis avariuli gaJonvis amocanebis imitaciuri modelireba milsadenebze. Tsu i.vekuas gamoyenebiTi maTematikis institutis gafarToebuli seminari "maTematikuri modelirebisa da gamoTvliTi maTematikis seqcia" 22 aprili, 2010.
15. daviTaSvili T., samxaraZe i. araerTgvarovan zedapirze daRvrili navTobis niadagSi filtraciis amocana. Tsu i.vekuas gamoyenebiTi maTematikis institutis gafarToebuli seminari "gamoTvliTi meqanikis seqcia" 22 aprili, 2010.
16. gordexiani d., .daviTaSvili T. 'avariulad daRvrili navTobis myar da Txevad garemoSi gavrcelebis maTematikuri modelireba' Tsu i.vekuas saxelobis gamoyenebiTi maTematikis institutis seminari, 20 oqtomberi, 2010
17. xvedelidze z., daviTaSvili T., samxaraZe i. "mTa-goriani teritoriis atmosferoSi mcire droSi didi simZlavris SeSfoTebebis agresiis gavtcelebis Seswavla" saqarTvelos hidrometeorologiur institutis samecniero seminari, ivlisi, 2010
18. xvedelidze z., daviTaSvili T., samxaraZe i. "atmosferosa da hidrosferoSi minarevTa fenovani nakadebis Seswavla reliefis gavlenis gaTvaliswinebiT" saqarTvelos hidrometeorologiur institutis samecniero seminari, dekemberi, 2010
19. TavarTilaZe k. "gvalvebisa da gaudabnoebis xelSemwyobi procesebi saqarTveloSi" saqarTvelos hidrometeorologiur institutis samecniero seminari, ivlisi, 2010
20. gordeziani d., daviTaSvili T., gordeziani e. wylis dabinZurebis zogierTi amocanis maTematikuri modelebisa da ricxviTi amoxsnis algoriTmebis Sesaxeb. saqarTvelos meqanikosTa kavSiris pirveli yovelwliuri konferencia 20-22 dekemberi, 2010, Tbilisi.
21. papukaSvili a., gordeziani d., daviTaSvili T.. drekadobis Teoriis antibrtyeli amocanebis miaxloebiTi amoxsnis zogierTi sakiTxi bzarebiT Sesustebuli Sedgenili sxeulebisTvis. saqarTvelos meqanikosTa kavSiris pirveli yovelwliuri konferencia 20-22 dekemberi, 2010, Tbilisi.

2009/2010 saswavlo wlis meore semestrSi da 2010/2011 saswavlo wlis pirvel semestrSi laboratoriuli samuSaoebi Cautarda Tsu zusti da sabunebis-metyvelo mecnierebebis fakultetis 164 students

4.3. gamoyenebiTi logikisa da programirebis laboratoria

laboratoriis Semadgenloba:
ruxaia ximuri _ laboratoriis gamge,
tibua lali _ ufrosi laboranti.

კვლევის თემა:თეორემათა ავტომატური მტკიცების ლოგიკური მეთოდების ძიება-სრულყოფა და რეალიზაცია

კვლევაში ჩართული პერსონალი:
ruxaia ximuri, tibua lali

ჩატარებული samecniero სამუშაოს მოკლე რეზიუმე:

agebulia τ-logikis formulebisaTvis τ-unifikaciis algoriTmi. τSR-logikaze dayrdnobiT agebulia dasturiTi programirebis erTi varianti.

samecniero პუბლიკაციები:

1. ხ. რუხაია; ლ.ტიბუა; პროგრამირების ზოგადი თეორიის ლოგიკური საფუძველი; საერთაშორისო კონფერენციის თეზისები ,,МАЛЬЦЕВСКИЕ ЧТЕНИЯ". В 2010;ნოვოსიბირსკი; http://www.math.nsc.ru/conference/malmeet/10/abstracts.pdf
2. Rukhaia Kh; Tibua L.; Dundua B.; A METHOD FOR XML PROCESSING AND REASONING; LAYOUT AND TYPESETTING TAAPSD 2010; http://taapsd.ukma.kiev.ua
3. Прикладные вопросы теории обозначений;Кибернетика и системный анализ;2010;
4. Kh.Rukhaia; L.Tibua; G.Fedulov; N. Iashvili; Tool to find the bounds of objective foubdions for the tasks of one-dimensional bin packing class; First International Conference book of abstracts;Batumi; September 12-19,2010;
5. ხ. რუხაია, ლ. ტიბუა; აღნიშვნათა თეორიის საკითხები ხელოვნური ენებისათვის; First International Conference book of abstracts;Batumi; September 12-19,2010;

კონფერენციებში მონაწილეობა:

1. ხ. რუხაია; ლ.ტიბუა; პროგრამირების ზოგადი თეორიის ლოგიკური საფუძველი; საერთაშორისო კონფერენცია ,,МАЛЬЦЕВСКИЕ ЧТЕНИЯ". В 2010;ნოვოსიბირსკი; http://www.math.nsc.ru/conference/malmeet/10/abstracts.pdf
2. Rukhaia Kh; Tibua L.; Dundua B.; A METHOD FOR XML PROCESSING AND REASONING; LAYOUT AND TYPESETTING TAAPSD 2010; http://taapsd.ukma.kiev.ua
3. Kh.Rukhaia; L.Tibua; G.Fedulov; N. Iashvili; Tool to find the bounds of objective foubdions for the tasks of one-dimensional bin packing class; First International Conference;Batumi; September 12-19,2010;
4. ხ. რუხაია, ლ. ტიბუა; აღნიშვნათა თეორიის საკითხები ხელოვნური ენებისათვის; First International Conference;Batumi; September 12-19,2010;

2010/2011 saswavlo wlis pirvel semestrSi laboratoriuli samuSaoebi Cautarda Tsu zusti da sabunebismetyvelo mecnierebebis fakultetis 71 students.

5.1. 2010 wels gmi_is bazaze Catarda:

1. i. vekuas saxelobis gmi seminaris XXIV gafarToebuli sxdomebi, 21-23 aprili. saorganizacio komitetis Tavmjdomare – g. jaiani, moadgile - n.avazaSvili, swavluli mdivani – n. CinCalaZe, mdivani – m. gvaramaZe. muSaobda 14 seqcia, romelebzedac mosmenili iyo TbilisSi, agreTve quTaisSi da baTumSi moRvawe 208 mkvlevaris (maT Soris ori ucxoelis – a. sordi (italia), s. poirle (safrangeTi)) 137 moxseneba, maT Soris gmi-s TanamSromlebis g. aburjanias, n. avazaSvilis, j. anTiZis, g. arabiZis, g.axalaias, m. baSeleiSvilis, l. biwaZis, g. bogveraZis, d. gordezianis, n.dixaminjias, T. vaSaymaZis, n. ziraqaSvilis, r. koplataZis, T.meunargias, e.nadaraias, d. natroSvilis, j. rogavas, g. soxaZis, T. tetunaSvilis, g.fanculaias, T. qasraSvilis, T. ServaSiZis, d. Sulaias, m. wiklauris, a.xaraziSvilis, n. xomasuriZis, g. jaianis, v. jiqias moxsenebebi.
2. saqarTvelos meqanikosTa kavSiris pirveli yovelwliuri konferencia, 20-22 dekemberi. saorganizacio komitetis Tavmjdomare – g. jaiani. mosmenili iyo 49 monawilis (maT Soris ori ucxoelis –i. giulver da e. narTi (TurqeTi)) 26 moxseneba, maT Soris gmi-s TanamSromlebis m.baSeleiSvilis, l. biwaZis, i. giulveris, d. gordezianis, T. vaSaymaZis, T.meunargias, g.jaianis moxsenebebi.
3. maTematikisa da informatikis Tbilisis saerTaSoriso centris umaRlesi kursebi da minisimpoziumi “sasazRvro amocanebi kerZowarmoebulebiani diferencialuri gantolebebisaTvis” (23-24 ivnisi. kordinatori –g. jaiani). mosmenili iyo 21 monawilis (maT Soris ori ucxoelis – f. lanZara, a.Caldea (italia)) 17 moxseneba, maT Soris gmi-s TanamSromlebis d.gordezianis, T. vaSaymaZis, T. meunargias, j. rogavas, m. wiklauris moxsenebebi.
4. S. rusTavelis erovnuli samecniero fondis # 399 proeqtis (xelmZRvaneli – T. TadumaZe) samecniero konferencia “diferencialuri gantolebebi da optimaluri marTva” (22 noemberi), romlis monawileTa Soris iyo a.domoSnicki (israeli). moxseneba gaakeTa gmi-s TanamSromelma r.koplataZem.
5. S. rusTavelis erovnuli samecniero fondis # 399 proeqtis (xelmZRvaneli – T. TadumaZe) gafarToebuli seminari “dinamiuri sistemebis optimizacia da gamoyenebiTi maTematikis problemebi” (8 ivnisi), romlis monawileTa Soris iyvnen b. morduxoviCi (aSS) da l. tepoiani (somxeTi). moxseneba gaakeTa gmi-s TanamSromelma r. koplataZem.
6. S. rusTavelis erovnuli samecniero fondis # 100 proeqtis (xelmZRvaneli – g. giorgaZe) gafarToebuli seminari “elifsuri sistemebi rimanis zedapirebze” (23 seqtemberi), romlis monawileTa Soris iyo poloneTis mecnierebaTa akademiis akademikosi b. boiarski. moxseneba gaakeTes gmi-s TanamSromlebma g. axalaiam, T. vaSaymaZem da v. jiqiam.
7. saqarTvelos prezidentis iniciativiT TbilisSi Catarebuli “sazRvargareT moRvawe qarTvel mecnierTa forumis” (20-25 seqtemberi) farglebSi 22 seqtembers institutSi moxseneba gaakeTa gmi-s yofilma TanamSromelma, amJamad i. kepleris universitetSi (linci, avstria) moRvawe T. kuciam.

5.2. gmi_Si dasaqmebuli mecnier-mkvlevarebi monawileobdnen Semdegi samecniero Sekrebebis muSaobaSi

1. First International Conference of Georgian Mathematical Union, September 12-19, 2010, Batumi, Georgia.
   momxseneblebi: j. anTiZe, g. axalaia, m. baSeleiSvili, l. biwaZe, n. ziraqaSvili, T. meunargia, g. soxaZe, T tetunaSvili, d. Sulaia, n.xomasuriZe, g. jaiani, r. janjRava.
2. Conference of Andrea Razmadze Mathematical Institute, dedicated to Academician N. Muskhelishvili's 120th anniversary, Tbilisi, November 29 – December 3, 2010. momxseneblebi: T. ServaSiZe, a. xaraziSvili, s. xaribegaSvili.
3. The International Scientific Conference devoted to 80th anniversary of Academician I.V. Prangishvili "Information and Computer Technologies, Modelling, Control", Tbilisi ,2010.
   momxseneblebi: T. meunargia, j. rogava, m. wiklauri, g. jaiani.
4. The International Scientific-Technical Conference "Civil Engineering Mechanics Actual Problems", June 15-17, 2010, Tbilisi .
   momxsenebeli: g. jaiani.
5. 15- International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED), September 27-30, Tbilisi, Georgia, 2010.
   momxsenebeli: g. aburjania.
6. 1st international conference "Information and Computational Technologies" , organized by N. Muskhelishvili Institute of Computational Mathematics and St. Andrew the First Called Georgian University of the Patriarchy of Georgia, 2 – 6 May, Tbilisi, 2010.
   momxsenebeli: j. anTiZe.
7. International Conference GAMM 2010, 22-26 March, 2010, Karlsruhe, Germany.
   momxseneblebi: m. baSeleiSvili, l. biwaZe.
8. 2-nd International Scientific and Technical Conference "Architecture and Construction-contemporary problems problems",30 September-3 October, 2010,Yerevan-Jermuk.
   momxseneblebi: m. baSeleiSvili, l. biwaZe, n. ziraqaSvili, i. cagareli, n. xomasuriZe, r. janjRava.
9. The International Conference "Topical Problems of Continuum Mechanics", October 4-8, 2010, Dilijan, Armenia.
   momxsenebeli: g. jaiani.
10. Seminar guided by Dr. Flavia Lanzara Dipartamento di Matematica-Istituto "Guido Castellnuovo", Universitá degli Studi di Roma "La Sapienza", November 9, 2010 Italy
    momxsenebeli: g. jaiani.
11. The 6th International Conference: Dynamical Systems and Applications. Antalya– Turkey,2010.
    momxsenebeli: r. koplataZe.
12. Conference: Functional Differential Equations and Applications . Ariel, Israel, 2010.
    momxsenebeli: r. koplataZe.
13. Eleventh International Conference on Integral Methods in Science and Engineering, University of Brighton, UK, 12-14 July, 2010.
    momxsenebeli: d. natroSvili.
14. International Symposium on Trends in Applications of Mathematics to Mechanics (STAMM), Akademie Schmockwitz, Berlin, Germany, August 30 - September 2, 2010.
    momxsenebeli: d. natroSvili.
15. plazmis fizikis saerTaSoriso kongresi (8-13 agvisto, santiago, Cile, 2010.
    momxsenebeli: T. kalaZe.
16. saerTaSoriso konferencia Spring-2010 (ISS-2010, National Centre for Physics, March 1-6, 2010, islamabadi (pakistani).
    momxseneblebi: T. kalaZe, l. wamalaSvili.

17. International Workshop on Seismo-Electromagnetics and Atmospheric Science (IWSE-AS), agra, India, 2010.
momxseneblebi: T. kalaZe, l. wamalaSvili.
18. 4th International Conference Computational Methods in Applied Mathematic (CMAM) Bedlewo, Poland, 2010.
momxseneblebi: n. dixaminjia, j. rogava, m. wiklauri.
19. 15th International Congress on Computational and Applied Mathematics, Leuven, Belgium, 2010.
momxseneblebi: n. dixaminjia, j. rogava, m. wiklauri.
20. 38th Winter School in Abstract Analysis, Klenci pod Cerchovem, Czech Republic, January 16-23, 2010.
momxsenebeli: a. xaraziSvili.
21. International Conference Modern Stochastics: Theory and Applications II. September 7-11, 2010, Kyiv, Ukraine.
momxseneblebi: e. nadaraia, g. soxaZe.
22. The Third International Conference "Problems of Cybernetics and Informatics" , dedicated to the World Science Day for Peace and Development, PCI, September 6-8, Baku, Azerbaijan, 2010.
momxseneblebi: j. anTiZe, e. nadaraia, g. soxaZe, T. ServaSiZe.
23. Научно-практические аспекты развития современной техники и технологий в условиях курса на инновации. I Всероссийская научно-практическая (заочная) конференция. Санкт-Петербург, 15-17 ноября 2010.
momxsenebeli: g. soxaZe.
24. International Conference – IES, September 28 – October 3, 2010. Vinnytsia National Technical University, Vinnytsia, Ukraine.
momxsenebeli: j. anTiZe.
25. Boundary Value Problems, Functional Equations and Applications,12-19 April, 2010. Krakov Pedagogical University, Poland.
momxsenebeli: g. axalaia.
26. The 12th WSEAS International Conference on Mathematical and Computational methods in Science and Engineering (MACMESE'10). University of Algarve, Faro Portugal, November 3-5, 2010.
momxsenebeli: T. vaSaymaZe.

gmi_Si dasaqmebuli mecnieri-mkvlevarebi erToblivi samecniero kvlevis mizniT miwveuli iyvnen

natroSvili daviTi _ aveiros universitetSi (portugalia),

_ brunelis universitetSi (inglisi),

jaiani giorgi _ romis universitet 1-Si “La Sapienza” (italia).

mravalwliani kontraqtis safuZvelze laboris kolej-universitetSi (pakistani) muSaobda T. kalaZe.

2010 wels gmi-Si samecniero-kvleviT muSaobas eweodnen

Tsu-s emeritus profesorebi d. gordeziani, T. vaSaymaZe, profesorebi g. avaliSvili, r. boWoriSvili, a. gamyreliZe, f. dvaliSvili, T. daviTaSvili, T. TadumaZe, i. Tavxelize, e. nadaraia, r. omanaZe, a. yifiani.