



Seminario Internacional Complutense.

EARTH SCIENCES AND MATHEMATICS

**Facultad de Ciencias Matemáticas
Universidad Complutense de Madrid
September 13-15, 2006.**

PROGRAMME

ORGANIZING COMMITTEE

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LOCATION

Universidad Complutense de Madrid, Faculty of Mathematics, Aula “Miguel de Guzman” , and Room 250 A, 2nd floor.

SUPPORTED BY

Universidad Complutense de Madrid (UCM)
Consejo Superior de Investigaciones Científicas (CSIC)
Ministerio de Educación y Ciencia
Instituto de Astronomía y Geodesia (CSIC-UCM)
Instituto de Matemática Interdisciplinar (UCM)

Wednesday, 13th September, 2006

Morning

- 9:00 – 9:30 Registration.
- 9:30 – 10:00 Presentation of SIC.
C. Acebal (Vicerrectora de Investigación y Política Científica, UCM);
X. Bellés (Coordinador Científico y Técnico del Área de Recursos Naturales, CSIC)
J. A. Tejada (Decano, Fac. C. Matemáticas, UCM)
J. I. Díaz (UCM)
J. Fernández (CSIC-UCM)
F. Luzón (Univ. Almería)

Chair-person: *J. I. Díaz.*

- 10:00 – 11:00 The mathematics and statistics of self-organizing complex earth systems.
D.L. Turcotte.
- 11:00 – 11:30 Coffee Break
- 11:30 – 12:00 Mathematical Models of Hydrological Cycle.
S. Antontsev.
- 12:00 – 12:30 Long-term persistence in nature: On the clustering of extreme events.
A. Bunde.
- 12:30 – 13:00 On the mathematical analysis of an elastic gravitational problem in a layered Earth model.
A. Arjona, J. I. Díaz, J. Fernández, J. B. Rundle.
- 13:00 – 13:30 Recent advances in Earth rotation modelling.
J. M. Ferrándiz.

Wednesday, 13th September, 2006

Afternoon

Chair-person: *J. Tejada*.

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| 15:00 – 15:30 | The selfish faults.
<i>G. de Vicente.</i> |
| 15:30 – 16:00 | Results of the extensometric measurements in Carpatho-Pannonian region.
<i>L. Brimich.</i> |
| 16:00 – 16:30 | Steric sea level change and its impact on the gravity field caused by global climate change.
<u><i>S. Rödelisperger</i></u> , <i>M. Kuhn, O. Makarynskyy.</i> |
| 16:30 – 17:00 | Coffee Break. |
| 16:00 – 16:30 | Characterization and modeling of the seismic response at the Zafarraya basin (South Spain).
<u><i>F. Luzón</i></u> , <i>J. A. Pérez-Ruiz, A. García-Jerez.</i> |
| 16:00 – 16:30 | Analysis of hydraulic and tracer tests in fractured geological media represented by DFN Fractal models.
<u><i>F. J. Elorza</i></u> , <i>R. Nita, L. D. Donado, X. Sánchez-Vila.</i> |
| 17:00 – 17:30 | Study of Alhoceima earthquake (24/02/2004, Morocco, $M_w=6.2$) from inversion of body wave forms.
<u><i>E. Buforn</i></u> , <i>C. del Fresno, A. Gomis, A. Udías.</i> |

Thursday, 14th September, 2006

Morning

Chair-person: *D. L. Turcotte.*

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| 09:00 – 10:00 | Mathematical problems in glaciology.
<i>A. Fowler.</i> |
| 10:00 – 10:30 | Evidence of log-periodic oscillations during the breaking off of large ice masses
<i><u>J. Faillettaz</u>, M. Funk, A. Pralong.</i> |
| 10:30 – 11:00 | Modelling river channels formation.
<i>E. Schiavi.</i> |
| 11:00 – 11:30 | Coffee Break. |
| 11:30 – 12:00 | Potential Symmetry properties of a family of equations occurring in ice sheet dynamics
<i>J. I. Díaz, <u>R. J. Wiltshire</u>.</i> |
| 12:00 – 12:30 | Numerical methods for a coupled shallow ice model.
<i>C. Vázquez.</i> |
| 12:30 – 13:00 | Earthquake forecasting in differing tectonic regions, using the pattern informatics (PI) index.
<i><u>K. F. Tiampo</u>, J. B., Rundle, A. Jimenez, S., Levin, W. Klein.</i> |
| 13:00 – 13:30 | A free boundary problem: analysis of the grounding line behaviour.
<i>A.I. Muñoz.</i> |

Thursday, 14th September, 2006

Afternoon

Chair-person: *R. J. Wiltshire.*

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| 15:00 – 15:30 | 3D Indirect Boundary Element Method for deformation and gravity changes in volcanic areas. Application to Teide Volcano (Tenerife, Canary Islands).
<i><u>M. Charco</u>, J. Fernández, F. Luzón, K. F. Tiampo, F. J. Sánchez-Sesma.</i> |
| 15:30 – 16:00 | On the mathematical treatment of a climate energy balance model coupled with a (latitude - depth) ocean model.
<i>L. Tello.</i> |
| 16:00 – 16:30 | Dating ice-flow change in Roosevelt Island, Antarctica, by the operation of the Raymond effect.
<i><u>C. Martín</u>, R. C.A. Hindmarsh, F. J. Navarro.</i> |
| 16:30 – 17:30 | Coffee Break. |
| 16:45 – 18:00 | POSTER SESSION |

Night

Official Dinner

Thursday, 14th September, 2006

POSTER SESSION

- * A segmentation procedure for land cover use based on neighborhood coloring.
J. Ardizzone, G. Biging, D. Gómez, V. López, J. Montero, J. Yáñez.
- * A pseudoparabolic problem with constraint in stratigraphy.
S. N. Antontsev, G. Gagneux, R. Luce and G. Vallet.
- * Satellite image analysis using PDE techniques.
L. Álvarez, C. Castaño, M. García M., K. Krissian, L. Mazorra, A. Salgado, J. Sánchez.
- * Modelling spatial distribution of heavy metals in soils using geostatistical analysis: a case study.
J. Carlos García-Díaz.
- * Measurements and Modeling of Deformation at La Palma Island detected by means of Radar Interferometry.
P. González, J. Fernández.
- * Characterization, simulation and testing of particle and pore size distributions in soil by means of Fractal Models and Tools.
M. A. Martín, J. Caniego, E. Montero, J. M. Rey, M. Reyes, F. San José, F. J. Taguas.
- * Mathematical modelling of the interplay between physical and chemical heterogeneities in soil.
M. A. Martín.
- * On the multifractal features of pedodiversity distributions at planetary scale.
F. J. Caniego, F. San José, J.J. Ibáñez.
- * Characterization of soil micro and macroporosity using digital images: A multifractal approach.
C. García-Gutiérrez, F. San José.
- * Experimental Characterization of Hydration and Pinning of Heterogeneous Swelling Porous Media.
A. Brú, J. M. Pastor.
- * Inversion of SAR data in active volcanic areas using a genetic algorithm
G. Nunnari, G. Puglisi, F. Guglielmino.
- * Modeling Tilt Time Series for Isolating Precursors of the Volcanic Activity
G. Nunnari, F. Cannavò, G. Puglisi, S. Gambino.
- * Analysis of ground deformations time-series measured at Stromboli (THEODOROS System) from 2003 to 2005
G. Nunnari, G. Puglisi, A. Spata.

Friday, 15th September, 2006

Morning

Chair-person: *F. Luzón*.

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| 09:00 – 10:00 | Earthquake Forecasting, Numerical Simulations, and Space-Time Patterns.
<i>J. B. Rundle.</i> |
| 10:00 – 10:30 | An explorative non-linear inversion applied to the gravimetric study of the Earth's interior.
<i>A. G. Camacho.</i> |
| 10:30 – 11:00 | Numerical thermo-mechanical algorithms for continental lithospheric rejuvenation processes; application to the Alboran Sea.
<i><u>J. L. Valera</u>, A. M. Negredo.</i> |
| 11:00 – 11:30 | Coffee Break. |
| 11:30 – 12:00 | Equipartition of Elastic Waves.
<i><u>F. J. Sánchez-Sesma</u>, M. Campillo, F. Luzón, J. A. Pérez-Ruiz, and A. Rodríguez-Castellanos</i> |
| 12:00 – 12:30 | InSAR study of active African volcanoes: preliminary results of the SAMAAV project.
<i><u>N. d'Oreye</u>, F. Kervyn, J. Fernández and the SAMAAV team.</i> |
| 12:30 – 13:00 | A numerical model of a nonlinear diffusive climate energy balance model.
<i>R. Bermejo.</i> |
| 13:00 – 13:30 | New geodetic techniques and analytical tools to study ground deformation on volcanic areas: the example of Sicilian volcanoes.
<i>G. Puglisi.</i> |

Friday, 15th September, 2006

Afternoon

Chair-person: *J. Fernández.*

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| 15:00 – 15:30 | A new method for the solution of the inverse electrical capacitance tomography problem and its application to image reconstruction of multiphase flows.
<i>A. Fraguera.</i> |
| 15:30 – 16:00 | The scaling on morphostructural zoning methods to detect seismo-volcanic prone areas. The case of the Deception Island (South Shetland, Antarctica).
<i>C. Paredes, J. L. Giner-Robles, R. Pérez-López, R. De la Vega, J. J. Martínez-Díaz, S. de Vicente.</i> |
| 16:00 – 16:10 | Closing of the SIC.
<i>J. I. Díaz, J. Fernández.</i> |