Contents

1817 Introduction
P. Mora, M. Matsu'ura, R. Madariaga and J.-B. Minster

Part I: Microscopic Simulation

- 1821 Numerical Simulation of Localisation Phenomena in a Fault Zone
 D. Place and P. Mora
- 1847 Shear Heating in Granular Layers K. Mair and C. Marone
- 1867 Extension of the Lattice Solid Model to Incorporate Temperature Related Effects
 S. Abe, P. Mora and D. Place
- Hybrid Modelling of Coupled Pore Fluid-solid Deformation Problems

 H. Sakaguchi and H.-B. Mühlhaus
- 1905 Numerical Simulation of Rock Failure and Earthquake Process on Mesoscopic Scale
 - Y. C. Wang, X. C. Yin, F. J. Ke, M. F. Xia and K. Y. Peng
- 1929 Damage Localization as a Possible Precursor of Earthquake Rupture H. L. Li, Y. L. Bai, M. F. Xia, F. J. Ke and X. C. Yin
- 1945 Evolution-induced Catastrophe and its Predictability Y. J. Wei, M. F. Xia, F. J. Ke, X. C. Yin and Y. L. Bai
- Part II: Macroscopic Simulation: Short Time Scale Phenomena (Rupture and Strong Motion)
- 1959 Dynamic Propagation and Interaction of a Rupture Front on a Planar Fault

 E. Fukuyama and R. Madariaga
- 1981 Criticality of Rupture Dynamics in 3-D R. Madariaga and K. B. Olsen



- 2003 Spontaneous Rupture Propagation on a Non-planar Fault in 3-D Elastic Medium
 - H. Aochi, E. Fukuyama and M. Matsu'ura
- Constraints on Stress and Friction from Dynamic Rupture Models of the
 1994 Northridge, California, Earthquake
 S. B. Nielsen and K. B. Olsen
- 2047 Parallel 3-D Simulation of Ground Motion for the 1995 Kobe Earthquake: The Component Decomposition Approach *T. Furumura and K. Koketsu*
- 2063 Computer Simulation of Strong Ground Motion near a Fault Using Dynamic Fault Rupture Modeling: Spatial Distribution of the Peak Ground Velocity Vectors

 T. Mivatake
- 2083 Numerical Simulation of Dynamic Process of the Tangshan Earthquake by a New Method—LDDA
 Y. Cai, T. He and R. Wang
- 2105 Nonlinear Structural Subsystem of GeoFEM for Fault Zone Analysis M. Iizuka, H. Okuda and G. Yagawa
- Part III: Macroscopic Simulation: Long Time Scale Phenomena (Earthquake Cycle)
- 2125 3-D Physical Modelling of Stress Accumulation Processes at Transcurrent Plate Boundaries

 C. Hashimoto and M. Matsu'ura
- 2149 The Edges of Large Earthquakes and the Epicenters of Future Earthquakes: Stress-induced Correlations in Elastodynamic Fault Models

 B. E. Shaw
- 2165 Precursory Seismic Activation and Critical-point Phenomena J. B. Rundle, W. Klein, D. L. Turcotte and B. D. Malamud
- 2183 Evolution of Stress Deficit and Changing Rates of Seismicity in Cellular Automaton Models of Earthquake Faults

 D. Weatherley, S. C. Jaumé and P. Mora
- 2209 Accelerating Seismic Energy Release and Evolution of Event Time and Size Statistics: Results from Two Heterogeneous Cellular Automaton Models S. C. Jaumé, D. Weatherley and P. Mora

The Plausibility of Long-wavelength Stress Correlation or Stress Magnitude as a Mechanism for Precursory Seismicity: Results from Two Simple Elastic Models

M. E. Winter

Part IV: Scaling, Data Assimilation and Forecasting

- 2249 Scale-dependence in Earthquake Processes and Seismogenic Structures K. Aki
- 2259 A Physical Scaling Relation Between the Size of an Earthquake and its Nucleation Zone Size

 M. Ohnaka
- 2283 Regional Difference in Scaling Laws for Large Earthquakes and its Tectonic Implication

 Y. Fujii and M. Matsu'ura
- 2303 Continuous GPS Array and Present-day Crustal Deformation of Japan T. Sagiya, S. Miyazaki and T. Tada
- 2323 Implications of a Statistical Physics Approach for Earthquake Hazard Assessment and Forecasting
 V. G. Kossobokov, V. I. Keilis-Borok, D. L. Turcotte and B. D. Malamud
- 2351 Application of Linked Stress Release Model to Historical Earthquake Data: Comparison between Two Kinds of Tectonic Seismicity C. Lu and D. Vere-Jones
- 2365 Development of a New Approach to Earthquake Prediction: Load/Unload Response Ratio (LURR) Theory

 X. C. Yin, Y. C. Wang, K. Y. Peng, Y. L. Bai, H. T. Wang and X. F. Yin