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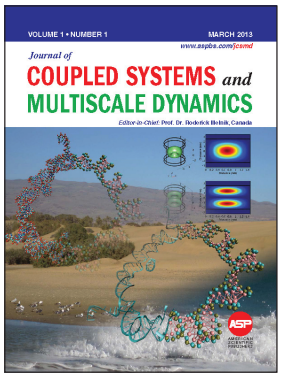

Journal of COUPLED SYSTEMS *and* MULTISCALE DYNAMICS

Editor-in-Chief: **Prof. Dr. Roderick Melnik, Canada**

AIMS and SCOPE

Journal of Coupled Systems and Multiscale Dynamics (JCSMD) is an international, peer-reviewed interdisciplinary journal that provides a unique publication forum for addressing challenges and new emerging problems in the study of coupled systems, their dynamics, as well as associated phenomena and processes. The journal publishes high quality contributions in all aspects of such systems, including analysis, modeling, control, and applications. Some of the most challenging problems in science and engineering require dealing with several different physical fields, the interaction of different parts of the system, and the interactions of various length and time scales, which may or may not be known a priori. Most such problems require mathematical modeling approaches for their solution. As many areas of science and engineering were conventionally divided in the past, these problems were difficult to address. With the development of new mathematical modeling techniques, such as those based on multifield, multiscale approaches, the situation is rapidly changing and we are now in a position to meet such challenges. The journal welcomes papers in all aspects of this development directed toward the study of coupled dynamic systems, phenomena, and processes, both deterministic and stochastic. This includes model developments for coupled dynamic problems, their applications, fundamental mathematical problems in advancing the theory of coupled dynamic systems, as well as the development of new numerical procedures, high performance computing, and algorithmic aspects related to solving such problems.

RESEARCH TOPICS COVERED (but not limited to)

- Multifield problems in science and engineering (e.g., thermoelasticity, piezoelectricity, phase-field models, magneto-hydrodynamics, geomechanics);
- Complex systems (from oscillators to networks), including uncertainty analysis and quantification;
- Applications in engineering and materials science ranging from mechanical, civil and environmental engineering to biomechanics and bioengineering (e.g., heterogeneous media, fluid-structure interactions, plasma-solid modeling);
- Multiscale problems (from atomistic to macroscopic scales, from nanoscience and its applications to large scale dynamics);
- Life science applications (from processes at the macromolecular level to neuroscience and to biomedicine);
- Coupled human-environment systems, mathematical models in sustainability science;
- Industrial applications (e.g.,smart materials and systems, alternative energy problems, bioinspired and bionic systems, multibody systems with constrains);
- Applications in finance, economics, business, and social sciences;
- Coupled dynamic problems in astrophysics and cosmology, models coupling matter and light;
- Coupled systems dynamics in earth and climate modeling.

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