Editorial

Frontiers in Computational Physics: Modeling the Earth System

In January 2013, the Journal of Computational Physics announced an open call for quality papers to topical issues on Frontiers in Computational Physics devoted to modelling the Earth System. Computational models play an essential role in diagnosis and prognosis of all elements of the Earth System, from solar variability through space weather, geomechanics, terrestrial climate and weather, down to ground water flow. The current topical issue is meant to provide a forum for exchanging and sharing experience and knowledge across disciplines on advanced computational techniques, methods and models to improve the simulation of the Earth System. With computational aspects in focus, the physical emphasis is on natural problems that are complex, coupled and multiscale. The emphasised themes of particular interest include: global systems and complexity models; global and regional climate; uncertainty quantification; solar variability and space weather; weather, deep atmosphere, planetary boundary layer, air quality; ocean, anisotropy, eddy resolving computations; water cycle, glaciology, ground water flow; geology and geomechanics; multiscale interactions, turbulence, extreme events, and subgrid-scale parameterizations. All the contributions reflect well the multiscale, multiphysics intricacies of the Earth System, while stressing the importance of computational models in advancing our knowledge beyond observations. All the papers selected for publication undergone the usual review process, according to the journal standards.

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