

Towards Exascale Geophysical Flow Computations

Minisymposium at the 2014 SIAM Annual Meeting in Chicago, July 7–11

organized by Omar Ghattas, Björn Gmeiner, and Christian Waluga

Abstract

An essential part of geophysical research deals with the study of large-scale flow phenomena on and inside Earth, e.g., the dynamics of the atmosphere, the ocean, ice-sheets and the mantle. Besides the cost for solving the forward problem, inverse computations and uncertainty quantification techniques demand enormous computational effort. To maintain good parallel efficiency on future exascale systems, a performance driven co-design is necessary, involving the systematic complexity analysis of mathematical methods and the design of physics-aware approaches. In this minisymposium we bring together experts of different disciplines to discuss scalable computational methods for geophysical large-scale simulations while highlighting recent advances.