ADVANCES IN NUMERICAL METHODS FOR ATMOSPHERE AND OCEAN DYNAMICS SIMULATIONS

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ABSTRACT

Forecasting the rapid changes in the Earth's climate is one of the biggest challenges of our times. Fast and accurate weather/climate/ocean dynamics forecasts need state-of-the-art numerical and computational methodologies due to the high computational complexity of solving systems described by partial differential equations. This minisymposium is about the development and application of computational approaches in the field of geophysical fluid dynamics [1, 2, 3, 4, 5].

The focus is on efficient numerical techniques, including high-fidelity finite elements, finite volumes, discontinuous Galerkin and spectral elements methods as well as reduced order models to deal with complex phenomena arising in ocean and atmospheric flows. Examples of these phenomena are turbulence, compressibility and multi-phase interfaces. Efficient and accurate numerical methods for real world applications have undergone fast development during the last decade and have become a new frontier in scientific computing. This minisymposium will discuss the most recent development and identify new directions and perspectives.

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