Space Weather Simulations with NUMA

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Abstract

The Nonhydrostatic Unified Model of the Atmosphere (NUMA) has been extended to space weather applications. We discuss the challenges in extending terrestrial weather models to be space weather capable. These challenges are of a mathematical, numerical, practical, and computational nature. We show simulations of the propagation of high-altitude acoustic and gravity waves and show comparisons of linearized solutions. We discuss the role of adaptive mesh refinement, implicit time-integration, and GPU computing, required to make space weather models feasible.

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