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**A petascale-ready version of the Community Atmospheric Model**

**Abstract:** One of the main goals of the climate modeling community is the development of first generation earth system models. Achieving this goal will require sustained petascale performance on DOE's upcoming computing platforms. I will outline some of the algorithmic challenges faced by the atmospheric community in developing a petascale ready version of the Community Atmospheric Model (CAM), one of the key components in the Community Climate System Model (CCSM).

Current approaches are focused on today's main bottleneck: the need for spatial discretizations that can handle spherical geometry while allowing efficient domain decomposition. But even with perfect domain decomposition, climate models will still face a time-stepping bottleneck, where larger computers will allow us to model more processes at higher resolution, but the time-to-solution will only continue to decrease unless new time stepping methods can be developed.

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