ABSTRACT

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Title: The representation of tropical cyclones within the global non-hydrostatic Goddard Earth Observing System Model (GEOS-5) at cloud-permitting resolutions

The Goddard Earth Observing System Model (GEOS-5), an earth system model developed in the NASA Global Modeling and Assimilation Office (GMAO), has integrated the non-hydrostatic finite-volume dynamical core on the cubed-sphere grid. The extension to a non-hydrostatic dynamical framework and the quasi-uniform cubed-sphere geometry permits the efficient exploration of global weather and climate modeling at cloud permitting resolutions of 10- to 4-km on today's high performance computing platforms. We have explored a series of incremental increases in global resolution with GEOS-5 from it's standard 72-level 27-km resolution (~5.5 million cells covering the globe from the surface to 0.1 hPa) down to 3.5-km (~3.6 billion cells).

We will present results focused on the representation of tropical cyclones within GEOS-5 and the impact of resolution and the role of convective parameterization. The vertical and horizontal structure of specific tropical cyclones will be examined along with the seasonal characteristics of tropical cyclone formation and intensity at increasing resolution.