

초청강연 1

Recent developments in the Community Earth System Model (CESM)

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This talk will describe recent development activity for the Community Earth System Model (CESM), which is aimed at, but not restricted to, the upcoming 7th Climate Model Intercomparison Project (CMIP7). We will focus on the new Community Atmosphere Model version 7 (CAM7).

A key change in CAM7 over previous versions is a new vertical grid that possesses significantly higher vertical resolution throughout the troposphere and stratosphere, and also uses a much higher top boundary close to 85km instead of 40km. This change was intended to provide CAM7 with a well-resolved stratosphere, as well as better resolution in the planetary boundary layer (PBL).

The updated vertical grid presented challenges to several aspects of CAM physics, including radiation, gravity wave drag (GWD), PBL turbulence, and deep convection. We will discuss how these challenges have been addressed in the model physics, and show results from our most recent simulations.

CESM is also targeting higher horizontal resolution. Higher horizontal resolution has been shown by Chang et al. (2025) to improve the connection between simulated mesoscale circulations (weather) and precipitation extremes. We will discuss preliminary results from CAM7 at 27km horizontal resolution.