

# **Evaluate the impacts of the convective gravity wave drag parameterization on the global circulation**

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## **Abstract**

This study will examine the impacts of the parameterized gravity wave drag on the zonal mean circulation and the mechanisms of gravity wave response to upper atmospheric dynamics. We include GTOPO30S orographic data (developed by U.S. Geological Survey) and Chun and Baik (1998) convective gravity wave drag scheme into the current Central Weather Bureau global forecast model (CWBGFS) in this study. The magnitude of gravity wave momentum flux is dependent on the thermal forcing and background wind. Momentum flux is zero below the forcing bottom, varies with height in the forcing region, and remains constant above the forcing top in our parameterization. Gravity waves are launched on the cloud top within the convection region. We evaluated different tests and the results have demonstrated that convective gravity wave drag has a strong impact on the large-scale flow in the midlatitude winter hemisphere and in the tropical area where deep cumulus convection persistently exists. The strength of the westerly jet in the midlatitude is decreased, and the temperature in the polar area is getting warmer. The interconnection between the tropical convection systems with the extratropical circulation will be evaluated in this study.

Key word: convective gravity wave drag