

# 國立中央大學大氣物理研究所書報討論

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## Orographic Controls on Extreme Precipitation Associated with a Mei-Yu Front

### Abstract

Taiwan regularly impacts extreme rainfall due to mei-yu fronts that are influenced by complex topography. Occurred between 1 and 3 June 2017 when a mei-yu front contributed to flooding and landslides from over 600 mm of rainfall in 12 h near the Taipei basin, and over 1500 mm of rainfall in 2 days near the Central Mountain Range (CMR).

This mei-yu event is simulated using the WRF Model with halved terrain as a sensitivity test to understand the orographic effects that modify the intensity, duration, and location of extreme rainfall. Reduction in terrain height produced a decrease in rainfall duration and accumulation in northern Taiwan and also decrease intensity over the CMR. The reductions in northern Taiwan are linked to a weaker orographic barrier jet with lower terrain height. The reductions in rainfall intensity and duration over the CMR are partially explained by lack of orographic enhancement to frontal convergence near the terrain. A prominent feature missing with the reduced terrain is a direction change of postfrontal westerly winds attributed to orographic deformation. Orographically deforming winds converge with prefrontal flow to sustain the mei-yu front. In both regions, the decrease in mei-yu front southern propagation speed is linked to increased rainfall duration.

### Keywords

Extreme Rainfall

Orographic Effect

### Reference

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