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Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa
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Analysis and Simulations of a Heavy Rainfall Event over Northern Taiwan during 11-12 June 2012

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Date: Wednesday, January 10, 2018
Refreshments: 3:00pm at MSB courtyard
Free Cookies, Coffee & Tea Provided
(Please Bring Your Own Cup)
Seminar Time: 3:30pm
Location: Marine Sciences Building, MSB 100

Abstract:

During the evening of 11-12 June 2012, heavy precipitation occurred over the northwestern Taiwan coast (~435 mm) and within the Taipei Basin (~477 mm). The large-scale airflow during the period is characterized by a mid-latitude omega-blocking pattern. A persistent cold northerly wind component west of the NE China low in mid-latitudes and west of the Mei-Yu frontal cyclone extends all the way to the subtropics and up to the 700 hPa level. At 1200 UTC (2000 LST) 11 June, the total precipitable water (TPW) ahead of the Mei-Yu front is elevated ($> 70 \text{ kg m}^{-2}$) with a strong ($> 15 \text{ m s}^{-1}$) low-level southwesterly flow.

The rainfall maximum along the northwestern coast mainly occurs before 0200 LST 12 June as the convective activities in the frontal zone are enhanced by the localized convergence between the prefrontal southerly barrier jet and the environmental airflow. After landfall, the relatively deep (~1.5 km) Mei-Yu front moves over the mountains (with peaks ~1,120 m) along the northern coast, and into the Taipei Basin where it stalls during 0200–0800 LST 12 June. Radar echoes associated with the Mei-Yu front are enhanced as they move southeastward toward the north/northwestern end of Snow-Shan Mountains, south of the Taipei Basin.

The barrier jet and the rainfall maxima over the northwestern coast and within the Taipei Basin are well simulated using the high-resolution WRF model. With the model terrain removed, the simulated Mei-Yu front continues to move southward after landfall without reproducing the barrier jet and heavy precipitation over northern Taiwan.