An OSSE Study for Potential Use in Field Projects

Shu-Hua Chen[1], Jhih-Ying Chen[2], Wei-Yu Chang[2], Pay-Liam Lin[2], Po-Hsiung Lin[3], Wen-Yih Sun[4]

[1]**Department of Land, Air, and Water Resources, University of California, Davis, CA**
[2] **Department of Atmospheric Sciences, National Central University, Chung-I, Taiwan**
[3] **Department of Atmospheric Sciences, National Taiwan University, Taipei, Taiwan**
[4] **National Typhoon and Flood Research Institute, Taichung, Taiwan**

Because of the physiogeographic characteristics, Taiwan is subject to the destructive effects of heavy rainfall, which occurs primarily during the May-June Mei-Yu season and when typhoons pass over the island between July and October. The Taiwan Island Monsoon Rainfall Experiment (TIMREX) was a joint Taiwan-US field program that was carried out from 15 May to 30 June 2008 to sample the heavy rainfall environment of southwestern Taiwan during the Mei-Yu season with modern multiscale observing systems. These instruments include surface weather stations, radiosondes, dropsondes, wind profilers, ground-based Doppler radars, mobile TEAM-R radar, S-POL radar, etc. The goal of TIMREX was to improve our understanding of the multiscale dynamical and physical processes associated with the terrain-induced heavy precipitation systems during the monsoonal environment of the Mei-Yu season.

In this study, an Observing System Experiment (OSSE) was conducted to assess the potential impact of TIMREX observational networks on forecasts of heavy orographic rainfall over southwestern Taiwan during the Mei-Yu season. The nature run, which is a proxy atmosphere specifically for the OSSE, was produced by the Weather Research and Forecasting (WRF) model with a resolution of 1 km. Programs were developed to simulate observations of the proxy atmosphere from different instruments. Numerical experiments were conducted to evaluate the impact of assimilating different types, locations, and frequencies of observations on heavy rainfall forecasts. The design of the OSSE study and preliminary results from numerical experiments will be presented.