Geophysical Research Abstracts, Vol. 8, 05622, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05622

Severe weather research activities in Taiwan and their applications to GPM ground validation

M.-J. Yang, C.-H. Sui, Y.-C. Liou, T.-C. Chen, W.-J. Chen, M.-D. Chou, G.-R. Liu, Y.-A. Liou, and J.-D. Jou

Inst. Hydrological Sciences, National Central Univ., Chung-Li, Taiwan
(mingjen@cc.ncu.edu.tw/Fax: +886-3-4222894)

Taiwan is frequently affected by severe weather systems embedded in synoptic Mei-Yu fronts, southwesterly monsoon flows, and landfalling typhoons. Heavy rainfalls associated with these hazardous weather systems induced severe flooding and landslide, which caused tremendous property damage and lose of human lives. In order to further our understanding of severe weather phenomena and improving forecast skill for these storms, Taiwanese meteorological community has conducted the ą§Taiwan Weather Research Programąİ (Taiwan-WRP) for a period of 10 years since 2000. Through the upgrading of observational infrastructure, development of next-generation numerical weather prediction model, and data collection in field experiments, the Taiwan-WRP is aimed at enhancing prediction skill of severe storms and reducing associated natural hazards.

The Central Weather Bureau (CWB) in Taiwan maintained the Doppler radar and automatic rain gauge networks. This facility is the central component of CWBąęs quantitative precipitation estimate product (QPESUM). In additional to the CWB facility, the National Central University (NCU) operates a S-band polarimetric Doppler radar, a VHF radar, disdrometers, and a Integrated Sounding System (ISS). The NCUąęs observational facility represents the achievement of NCU faculty members who have devoted to the radar and rainfall research for the past twenty years and will continue this endeavor in the foreseen future. Several NCU scientists also participated in the TRMM mission and performed the following research: 1) quality control of radar and rain gauge data in the Taiwan area, 2) radar rainfall estimate algorithms development, 3) mesoscale meteorology studies, and 4) the SCSMEX experiment.

Compliment to the precipitation research, a hydrometeorological modeling study is also set up at the NCU to couple either the rainfall estimation from the NCU polarmetric Doppler radar and/or standand GPM products, or the rainfall forecast from a mesoscale meteorological model (MM5 or WRF) with a physically-based distributed hydrological model (FLO2D or DHSVM). The predicted hydrological variable from the coupled hydrometeorological modeling system are validated against surface measurements of stream discharges and river depths. Li et al. (2005) described preliminary testing results with good runoff forecasts for Typhoons Herb (1996), Zeb (1998), and Nari (2001) over the Reservoir Shihmen catchment in Taiwan, and more testing cases on different weather regimes (like Mei-Yu front) will be reported in the GPM-GWC Symposium.