

Statistical Characteristics of Rainfalls of Typhoons Affecting Taiwan and Simulations of Typhoon Nepartak (2016)

*Jian-Liang Wang¹, Jheng-Kai Chen¹, Yu-Ching Lin¹, Ming-Da Tsai¹, Ing-Jiunn Su²

1. Dept. of Environmental Information and Engineering, CCIT, National Defense Univ., Taiwan, 2. Dept. of Electrical and Electronic Engineering, CCIT, National Defense Univ., Taiwan

For typhoons affecting Taiwan in the past 100 plus years (1911-2016), the tracks have been divided into 9 categories by the Central Weather Bureau. Among those categories, typhoons along the 4th track, coming from the Pacific Ocean, crossing South Taiwan, and moving westward or northwestward afterwards, often brought tremendous rainfalls and caused catastrophic damages in the mountainous areas or along rivers in south Taiwan, e.g., Typhoons Fanapi (2010) and Nepartak (2016). For the purpose of disaster mitigation, it is desired to know the rainfall patterns associated with the 4th-track typhoons. Firstly, this study examined the qualitative statistical characteristics for the 4th-track typhoons in the past 20 years. It was shown that the location of peak accumulated rainfall was in the east of Taiwan before landfall and moved to the south of Taiwan afterwards for the 4th-track typhoons. Secondly, Typhoon Nepartak (2016) was simulated as a case study using the WRF model to examine the sensitivities of typhoon track, intensity, and rainfall pattern to microphysics schemes. Six different microphysics schemes have been tested. Among them, the Thompson aerosol-aware scheme has the closest simulated rainfall patterns and accumulated rainfall peaks compared with observations. However, the choice of microphysics schemes has little impacts on the typhoon's track and intensity. In this paper, the impacts of microphysics schemes on rainfall patterns have been closely examined and the results will be shown and discussed in details of comparisons among different microphysics schemes in the conference.

Keywords: 4th-Track Typhoon, WRF Numerical Simulation, Microphysics Scheme