[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-AS Atmospheric Sciences, Meteorology & Atmospheric Environment

[A-AS03]Advances in Tropical Cyclone Research: Past, Present, and Future

convener:Masuo Nakano(JAMSTEC Japan Agency for Marine-Earth Science and Technology), Akiyoshi Wada(Typhoon Research Department Meteorological Research Institute), Sachie Kanada(名古屋大学宇宙地球環境研究所, 共同), Kosuke Ito(University of the Ryukyus)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Tropical cyclones (TCs) often bring torrential rainfall, gale, storm surge, and high surf that sometimes cause tremendous disasters. Therefore, understanding such phenomena associated with translation, intensity change, and precipitation of TCs and their accurate forecasts are important in the earth and planetary science. In addition, changes in the number and intensity of TCs due to global climate changes have been extensively studied by various approaches such as data rescue, data analyses, and climate modelling. Especially in 2017, Typhoon Talim made landfall on all of four major islands of Japan first ever since 1951 and Typhoon Noru had a strange track. In the Northern Atlantic, Hurricanes Harvey, Irma and Maria caused tremendous damage in U.S.
Advances in innovative observations such as Himawari-8,9, unmanned drone, meteorological aircraft reconnaissance and supercomputers such as the earth simulator and K-computer have led to novel development of numerical weather forecasting and understanding of the phenomena due to the improvement of numerical modelling.
In this session, we welcome papers on various aspects of TC studies. We hope that the session will provide new direction for future TC research activity.

[AAS03-P09]The Study on the Interactions between Meigi (2010)Typhoon Outer Circulation and Topography in Northeast of Taiwan

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Keywords:WRF Model, Typhoon Meigi, Northeasterly Monsoon, Returning Flow

This study uses WRF (Weather Research and Forecasting) model to simulate the heavy precipitation events triggered by Typhoon Meigi on October 21, 2010 in Yilan area. The results showed that the low-level wind speed increases as a result of prevailing northeasterly monsoon and Meigi typhoon outer circulation convergence in Yilan area. The more inland, the more wind speed increase. Water vapor caused by the terrain rapid lifting before the heavy rainfall. According to past scholars' research, water vapor across hill may cause precipitation on the top of a mountain, and even the entire precipitation system may pass to downstream direction. This simulation also has a similar situation. Therefore, the location of heavy rains is highly correlated with the topography around the Lanyang Plain.

The terrain of the bell mouth of the Lanyang Plain enhances the strength of the northeast monsoon. Affected by the terrain, low-level convergence occurs when the low-level airflow produces returning flow. Convergence of the lifting effect makes significant precipitation in the area. This study summarizes the heavy precipitation produced by Meigi typhoon in Yilan area, which may be mainly dominated by two kinds of physical mechanisms. The first is the elevation of the terrain and the effect of low-level returning flow in front of mountains. This mechanism has been successfully simulated and

analyzed in this study. The second one is the mechanism of quasi frontogenesis. We can see the existence of this mechanism in this study.