

[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)

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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-P08]Future Changes in the Intraseasonal Variability and Typhoon Activity in a Nonhydrostatic Global Atmospheric Model

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The intraseasonal variability (ISV) modulates typhoon activity in the western north Pacific. How the ISV will change in a warmer climate and how this future change will affect typhoon activity are, however, open and difficult questions. Here, we examine future changes in the ISV and its related typhoon activity using climate simulations by 14 km mesh nonhydrostatic icosahedral atmospheric model, NICAM (Kodama et al. 2015). The ISV is detected by procedure proposed by Kikuchi et al. (2012), which classify the ISV into two modes; the boreal summer intraseasonal oscillation (BSISO) mode and the Madden-Julian oscillation (MJO) mode. Because the amplitude of the ISV modes simulated in NICAM was weaker than those observed, the amplitude was calibrated by dividing by 0.52 and 0.48 for BSISO and MJO modes, respectively.

The simulation results show that the number of BSISO days will significantly decrease in the warmer climate, whereas the number of MJO days will slightly increase in future. The number of typhoons formed in BSISO day during the typhoon season (June-October) will significantly decrease in the warmer climate, whereas the typhoon formation rate for BSISO days will not change. Those results indicate that the number of typhoon formation related to BSISO in the future climate will decrease because the number of BSISO day will

decrease. Considering that the predictability of typhoon formation highly rely on that of BSISO (e.g., Nakano et al. 2015), understanding typhoon formation mechanism during no BSISO days would become important to keep the accuracy of typhoon formation prediction in a warmer climate.