

[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-P11] Statistical Analysis of Tropical Cyclones in the Solomon Islands

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This work examines the tropical cyclone (TC) activity in Solomon Islands (SI) using the best track data from Tropical Cyclone Warning Centre (TCWC) Brisbane and Regional Specialised Meteorological Centre (RSMC) Nadi. Firstly, the long-term trend was investigated. The long-term trend analysis showed that the frequency of TCs has been decreasing in this region while average TC intensity becomes strong. Then the datasets were classified according to Madden-Julian Oscillation (MJO) and El Niño Southern Oscillation (ENSO) indexes provided by Bureau of Meteorology (BoM). TC genesis patterns significantly depend on the MJO-TC relationship over the SI region. The MJO has sufficiently influenced TC activity in the SI region with more genesis in phases 6-8. Among them, the most frequent genesis was observed in phase 6, in which lowest outgoing longwave radiation (OLR) is seen around SI region with enhanced convective activity favorable for TC genesis. In contrast, TC genesis occurs less frequently in phases 1, 2, and 5. The amplitude of MJO has notable effect on TC intensities. For example, relatively weak TCs in the gale category was associated with the inactive phases. It is also found that more TCs are generated in El Niño years compared to La Niña and neutral years. The TC genesis locations during El Niño (La Niña) period were significantly displaced to the north (south) over SI region. TCs during El Niño condition tended to be strong. This work also argues that the modulation and enhancements for TCs in the SI region may also be influenced by other seasonal climatic variability backgrounds like South Pacific Convergence Zone (SPCZ) and large-scale environmental conditions (e.g. sea surface temperature, low level relative vorticity, vertical wind shear, and upper level divergence). Finally, TC tracks in different motions were also checked using composites of wind fields

between 1000&ndash;200 hPa. The flow patterns showed strong relationship to mid tropospheric 700-400 hPa mean steering flow.