
[EJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG39] Multi-scale ocean-atmosphere interaction in the tropical Indo-Pacific region

convener:Yukiko Imada(Meteorological Research Institute, Japan Meteorological Agency), Tomoki Tozuka(Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo), Hiroki Tokinaga(京都大学防災研究所, 共同), Yu Kosaka(Research Center for Advanced Science and Technology, University of Tokyo)

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Multi-scale ocean-atmosphere interaction in the tropics exerts a significant imprint on the global climate via atmospheric teleconnection. Since the 1980s, anchored by in-situ and satellite observations, improvements in modeling and theoretical understanding, various aspects of dominant modes of interannual (e.g., ENSO and IOD), intraseasonal (e.g., MJO) variabilities and their impacts on tropical (e.g., monsoons) and extra-tropical (e.g., North America) climate variations have received wide attention. Recent satellite-based salinity measurements indicate for an active role of salinity in the tropical ocean-atmosphere interaction. While recent studies suggest a possible link between interdecadal Pacific oscillation and global warming hiatus in 2000s, changes (if any) in the tropical ocean-atmosphere interaction are yet to be understood. Due to interactions between different time scales, between different ocean basins, and with the extratropics, the tropical ocean and atmosphere play a key role in shaping climate, its variability and change. To better understand and examine these challenging issues from various perspectives, this session offers a forum to discuss recent progress in observational, modeling and theoretical studies of multi-scale tropical ocean-atmosphere interaction.

[ACG39-P02]Interannual variability of Australian summer monsoon and its remote influence on wintertime East Asian climate

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Keywords: monsoon, teleconnection, predictability

Variability of convective activity over the Maritime Continent (MC) influences climatic condition over East Asia via atmospheric teleconnections, through which SST variability such as ENSO is considered to provide seasonal predictability. In boreal winter, interannual variability of convection is centered around Indonesia and northern Australia, representing significant variability in the Australian summer monsoon (AUSM). Through an analysis of observational data, we show that interannual variability of austral summertime precipitation over northern Australia is hardly driven by tropical SST variability and is dominated by the internal variability of AUSM. Our analysis suggests that anomalously active AUSM sustains itself by inducing anomalous low-level westerlies over the eastern Indian Ocean and enhancing surface evaporation and moisture inflow into northern Australia. Anomalous AUSM activity is associated with distinct wavetrain pattern from the MC toward the extratropical North Pacific with dipolar pressure anomalies resembling the Western Pacific pattern. This teleconnection modulates the East Asian winter monsoon and exerts a significant impact on wintertime temperature and precipitation especially in Japan and Korea. This study reveals that interannual variability of the AUSM, which is unforced locally or remotely by tropical SST variability, substantially limits seasonal predictability in wintertime East Asia.