[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

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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-P01]ENSO prediction using an earth system model incorporating a high-resolution tropical ocean nesting model

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Mesoscale eddies in the tropical oceans have significant impacts on the oceanic mean states, atmospheric circulation, ENSO characteristics, and other natural variabilities. Here, we found a significant improvement of ENSO prediction skill by incorporating a high-resolution tropical ocean nesting model into a seasonal prediction system based on an earth system model MRI-ESM1. Because of the realistic representation of tropical instability waves (TIWs), the simulated eddy heat flux improves not only tropical oceanic mean states but also spatial distributions of mean surface wind stress and precipitation in the nested version of MRI-ESM1. ENSO characteristics (amplitude, period, spatial pattern, asymmetricity, teleconnection) are also modified through the changes of mean state, resulting in more accurate ENSO prediction several months ahead.