## Interantions among ENSO, the monsoon and diurnal cycle and rainfall variability in the Maritime Continent of Southeast Asia

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Interactions among El Niño - Southern Oscillation (ENSO), the monsoon and diurnal cycle have been studied to understand the spatial distribution and temporal variability of rainfall over the Maritime Continent in Southeast Asia by using high-resolution observations and regional climate model simulations. It is found that rainfall over the Maritime Continent is mostly concentrated over islands. Analysis of the diurnal cycles of rainfall and winds indicates that this is predominantly caused by the sea-breeze convergence over islands, reinforced by mountain-valley winds, and further amplified by the cumulus merger processes. Climate variability over the Maritime Continent is found spatially heterogeneous. Besides the well-known anomalous dry conditions that characterize the dry and transitioning seasons during an El Niño year, analyses of regional model output and rain gauge data reveal a wet south versus dry north dipolar structure of rainfall anomalies over the Java Island of Indonesia associated with El Niño during the peak rainy season. Modeling experiments indicate that this dipolar structure of rainfall anomalies is caused by interactions between the El Niño-induced monsoonal wind anomalies and the island/mountain-induced local diurnal cycle of winds. A weather typing cluster-analysis on satellite estimated and model simulated data is also used to study the impacts of ENSO and monsoon on the local rainfall variability.