

# Organization of convection over Sumatra and its relationship to large-scale fields

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Three mechanisms that caused the active convection over Sumatra, Indonesia from October to December 2001 will be presented. These mechanisms are summarized as follows.

(1) Eastward-propagating super cloud clusters (SCCs) developed over the Indian Ocean caused the active convection over Sumatra when SCCs reached to Sumatra. Zonal wind structure within SCCs remained over Sumatra, though low-level westerly in and around SCCs significantly became weak around Sumatra.

(2) Clockwise-circulation disturbances developed over the eastern edge of Indian Ocean (around 5S, 95E) caused the active convection around 0N, 90-100E by increasing the westerly over the equator at 90-100E. When convection was active around 0N, 90-100E, low-level moist air seemed to be transported from the Indian Ocean to Sumatra. Convective activity over Sumatra was strengthened when low-level moist air transported from the Indian Ocean to Sumatra.

(3) During the East-Asian cold surge events, northeasterly flow penetrated deeply southward over the South China sea caused the active convection over Sumatra by inducing the formation of low-level convergence over Sumatra.

We also found that eastward-propagating SCCs around 110E can cause the development of another SCCs over the Indian Ocean. When SCCs reached around 110E, clockwise-circulation disturbances developed around 110E in the southern hemisphere as a part of Rossby-Kelvin wave structure developed around 110E. These clockwise-circulation disturbances in the southern hemisphere moved westward, then caused the formation of SCCs over the Indian Ocean by supplying the low-level westerly over the equator region. This result suggests the circulation disturbances developed east of 100E in the Southern Hemisphere also can be a cause for the evolution of SCCs over the Indian Ocean.