

Quick water cycle over the Indonesian maritime continent: An "AM radio" hypothesis

YAMANAKA, Manabu D.^{1*}

¹DCOP, JAMSTEC / DP-GSS, Kobe U

High-resolution observations with radars and other hydrometeorological instruments have been installed and operated since JEPP-HARIMAU (FY2005-09) and SATREPS-MCCOE (FY2009-13) projects by Japan-Indonesia collaborations.

The most important result is that over the Indonesian maritime continent (IMC) all of landward (sea wind) water-vapor transport, rainfall and seaward (river) water transport have diurnal cycles, which suggest a very quick hydrologic cycle. In other words the water budget is almost balanced and reset every day, and is probably closed locally almost within a river basin, although the cycling (e.g. rainfall) amount is changed each day/area dependent on the diurnal-cycle (sea-land breeze circulation) amplitude controlled directly by sea-land heat/water contrast (affected by longer/larger scale climate such as cold surges and ENSO/IOD).

This situation is just like an AM radio, in which an input signal modifies the output amplitude but generates no interactions/modifications in the carrier wave frequency itself. Therefore, the concept/strategy of hydrometeorological observations/predictions over IMC must be somewhat different from those in mid-latitudes where synoptic-scale space-time continuity is most important. Namely, over the IMC, observations arranged in each area/basin and predictions restarted each day (with many recalculations analyzed statistically) would be more effective than in mid-latitudes.

Keywords: Indonesian maritime continent, cloud convection, water cycle, diurnal cycle, HARIMAU, MCCOE