HARIMAU2010 Intensive Observation on Torrential Rainfall Caused by Diurnally Developed Convections over Jakarta, Indonesia

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Jakarta, the capital megacity of Indonesia, is located over the equatorial tropical region in the maritime continent, and has been frequently suffered from serious floods caused by diurnally developed torrential rainfall. However, because of limited observations and studies in this area, mechanisms of the torrential rainfall over Jakarta area have not been solved yet as well as its environmental condition. In addition, climate which generate torrential rainfall in Jakarta, such as diurnally developed convections and/or local land-sea breeze circulation, were studied only in the dry season and has not been investigated well in the rainy season.

We have carried out one month observation during the rainy season in 2010 (January - February) as the final campaign of JEPP/HARIMAU project to investigate the mechanism of torrential rainfall in Jakarta and its environment climate with a C-band Doppler radar (CDR) installed at Serpong (6.4S, 106.7E) in the southern part of Jakarta and intensive soundings at five stations (Serang, Kawawang, Bogor, Pramuka) surrounding the CDR site. These sounding data at the all stations showed clear diurnal variations in wind, temperature, and humidity in the lower troposphere. Especially, meridional circulations regarded as the land-sea breeze were shown in each sounding stations but their phases had specific time delay (or shift) each other. Whereas, variations of radar echo coverage area were not so simple that sounding data showed. Though they showed fundamental diurnal cycle in them, these variations were different each other over mountainous and coastal regions, and in active and inactive phases of synoptic disturbances such as MJO and monsoon northerly surges. Rainfall characteristics such as durations, echo top heights, echo profiles, convective fractions were also examined in terms of both diurnal variations and synoptic disturbances as causes of torrential rainfall over Jakarta.