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Synchronization of thunderstorm activities and OLR in tropical regions

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Based on Global ELF observation Network (GEON) and Outgoing Longwave Radiation (OLR) intensity, we carried out a correlated analysis between the number of the lightning strokes and cloud variation in the tropical regions, focusing the variation around one month periodicity. It was found that the number of lightning stokes in the Maritime Continent (MC) varies with about month periodicity in the period from February to June 2004 and shows positive correlation (R= ?0.8) with OLR in the Western Paci?c Warm Pool (WPWP). That is, when thunderstorm activity in the MC is enhanced, the OLR in WPWP becomes large, meaning less cloud amount. On the other hand, OLR in the central Africa shows negative correlation with the number of lightning stokes in the MC in that period (R= ?-0.7). Furthermore, in the central Africa OLR seems to re?ect the number of lightning strokes, showing good correlation between them. This implies that the activities of thunderstorms both in the central Africa and in the MC oscillate in the same phase. Such a synchronization of thunderstorms or cloud amount in global scale without phase difference has not been reported and seems difficult to explain these phenomena by conventional theories. We may need to consider the variation of solar activity, such as UV or galactic cosmic rays, whose variation in the present period (Feb-Jun 2004) shows good correlation with OLR variations in tropical region.

Keywords: thunderstorm, OLR, tropical region, synchronization