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Synchronization between thunderstorm activities and solar parameters

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Relationship between thunderstorm/cloud activities and solar parameters are examined based on lightning measurement by Global ELF observation Network (GEON) and Outgoing Longwave Radiation (OLR) intensity. A correlated analysis between the number of the lightning strokes, cloud variation in the tropical regions, and solar parameters was examined, 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. These observational facts may lead to consideration of solar activit, whose variation in the present period (Feb-Jun 2004) shows good correlation with OLR variations.

Keywords: lightning, thunderstorm, global, synchronization, solar activity