

An Observational Study on Intraseasonal Variations with Equatorial Atmosphere Radar in West Sumatera, Indonesia

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The equatorial atmosphere over Indonesia seems to play an important role upon global change of the earth's atmosphere. In order to observe the phenomena in the whole troposphere and the lowerstratosphere (2--20km) in the equatorial region, we installed the equatorial atmosphere radar (EAR) in Kototabang, West Sumatera, Indonesia (0.20S, 100.32E). The EAR has good time and height resolutions of about 85 sec and 150 m, respectively, and has been continuously operated since July 2001. Intraseasonal variations, which are one of the most dominant variations in the tropics, have been studied using the EAR in Indonesia.

Eastward propagating super cloud cluster (SCC) known as intraseasonal variation (ISV) or Madden Julian oscillation (MJO) clearly appeared in GMS IR data (TBB) over the radar site (0.2S) during June 2002. There was a good correlation between TBB and 2--4 km averaged daily zonal wind obtained with the EAR on that period. Namely, when enhanced convection existed in the west side of the EAR site, easterlies or weak westerlies were observed with the EAR, and conversely when enhanced convection was situated in the east side of the EAR site, westerlies were observed. We investigated the relation between 2--4 km averaged zonal wind and variance of vertical wind obtained with the EAR. Strong variance of vertical wind was observed when easterlies or weak westerlies were observed, and conversely weak variance of vertical wind was observed during strong westerlies. Regardless of the direction of 2--4 km averaged zonal wind, variance of vertical winds weakened above the tropopause height (about 16 km). Comparing between variance of vertical winds and radiosonde data at the same station showed that strong variance of vertical winds correlated with strong convections.