

Study of the Characteristics of Diurnal Variation in the Indonesian

Maritime Continent

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Abstract

Diurnal Variation of atmospheric water vapor at Pontianak, west Kalimantan, Indonesia was investigated by using radiosonde data, 1.3GHz wind profiler radar and surface meteorological observation data. Radiosonde observation was conducted from 03UT (10LT) 21 August 2008 to 00UT (07LT) 27 every 3 hours. Water vapor mixing ratio from surface observation has a clear semidiurnal variation. The first peak is around 9 LT, and the second peak is around 16 LT. During the radiosonde observational period, similar diurnal variation was seen on 21 August 2008. The ascending phase of the first peak is formed by the evaporating of surface water because of solar radiation heating from sunrise. The descending phase of the first peak is formed by mixing with the upper layer which has a lower mixing ratio through the development of mixing layer. The second peak is formed by rainfall.

Wind profiler radar wind is compared with radiosonde data to examine its accuracy. Wind profiler meridional wind is about 20% larger than radiosonde wind, while zonal wind is not. The zenith angle of meridional beam turns out to be mistaken to 17.36 degrees though it is expected to 14 degrees. As a result, meridional wind is overestimated by about 20 %.