

Large scale influence on precipitation propagation over Indonesia

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Mechanism of organization of cloud clusters (CCs) over Indonesian Maritime Continent (IMC) is linkage between its complex geographical variation and large-scale atmospheric structure/circulation. Super cloud cluster (SCC), which is recognized as eastward-propagating envelopes of convection, composed of westward-propagating CCs in mesoscale [1]. In this study, the relationship between statistical properties (zonal span, duration, and propagation speed) of cloud episodes/streaks in Hovmoller space and vertical shear of horizontal wind, convectively coupled Kelvin waves and Madden-Julian oscillation (MJO) is investigated.

Ten years of hourly infrared (IR) brightness temperature (T_b) are used to study the cloud episodes/streaks over the IMC. To estimate the statistics of cloud streak, a 2D-autocorrelation function is applied to the data in the Hovmoller space [2]. Daily interpolated OLR data are used to diagnose the MJO and Kelvin wave during the interest period. The MJO is diagnosed using a 30-96 days bandpass Lanczos filter on daily OLR anomalies following [3]. The Kelvin wave filtering retains eastward-propagating OLR signals within the 2.5-20 day period and wave numbers 1-14 [4].

Table 1 shows a summary of all streak characteristics in the 10°S- 10°N band for four classified months. In general, westward moving streaks are dominant, longer span and move faster than eastward moving streaks. Seasonal variation is also observed. The relationship between statistical properties of cloud episodes and large scale influence (e.g., MJO, Kelvin wave) will be presented in the meeting.

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Table 1: Summary of all streak characteristics in the 10°S-10°N band for four classified months.

Characteristics	DJF	MAM	JJA	SON
<i>Westward</i>				
No.	2839	2576	2383	3033
Mean speed (m/s)	-16.8	-16.4	-17.1	-16.6
Mean duration (h)	9.3	9.0	9.6	10.1
Mean span (km)	507.8	482.5	538.5	546.5
<i>Eastward</i>				
No.	1147	1058	635	733
Mean speed (m/s)	16.0	14.8	16.1	15.3
Mean duration (h)	7.4	7.9	7.4	7.3
Mean span (km)	381.6	373.4	396.5	365.3
Ratio	2.5	2.4	3.8	4.1