

MJO role on Intraseasonal variation of stable isotope of Precipitation in Indonesia Maritime Continent

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MJO (Madden-Julian Oscillation) is one of the disturbances for Asian Monsoon in the Maritime Continent Area. Intraseasonal variability of precipitation in the Indonesia Maritime Continent (IMC) is mainly due to The Madden-Julian Oscillation (MJO), cold surge, or other synoptic scale disturbance. This study examined the relationship between MJO and stable isotope in precipitation over the IMC. Observation and simulation model data from isotope circulation model was used. From 2001 - 2009, 10 main MJO events were detected and 6 of the event occurred at Boreal Winter season (Asian Monsoon). Temporal and spatial analysis from simulated stable isotopes model reveals that isotopic variation is correlated to MJO event in different phase for different stations. Generally, $\delta^{18}\text{O}$ in precipitation became lighter in most observation station at phase 3, 4 and 5 at western part of IMC, and phase 4, 5, and 6 at north east part of IMC. Spatial distribution of $\delta^{18}\text{O}$ in precipitation for each MJO phase show that mainly MJO governed $\delta^{18}\text{O}$ variability in intraseasonal timescale for IMC area. Further investigation showed clear signal of MJO in $\delta^{18}\text{O}$ was observed at Bukit Tinggi (GAW) station only; it is confirmed with result from Isotope Circulation Model (ICM). When MJO is in active phase (enhanced) precipitation in western part of IMC, precipitable water was came from Indian Ocean and South IMC Ocean.

Keywords: asian monsoon disturbance, stable isotope, Madden Julian Oscillation, moisture transport analysis