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Water Origin over Indonesia Maritime Continent with Isotope Circulation Model

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By using the data obtained by a global Rayleigh-type circulation model with the Japanese long-term re-analysis project, we determined the seasonal changes of water sources trajectory to Maritime Continent. The model output was validated by the observation data of the Oxygen-18 and Deuterium content in precipitation at nine stations. The model performed well statistically in reproducing the simulated stable isotope in precipitation. The model demonstrates the seasonal characteristics of the water origin in three climatic patterns: (1) the semi-annual pattern, in which seasonal changes are indicated by the alternating presence of water from the northern and southern Maritime-Continent seas, (2) the anti-monsoonal pattern, represented by the alternating presence and absence of water from the southwest Pacific Ocean, southern Maritime Continent, and tropical Maritime-Continent sea, and (3) the monsoonal pattern, characterized by the alternating presence and absence of water from the northern Maritime Continent sea and Indian Ocean.

Keywords: Stable Isotope in Precipitation, Isotope Circulation Model, Water Origin, Asian-Australian Monsoon, Maritime Continent