

Seiki, A., S. Yokoi, and M. Katsumata, 2021: The impact of diurnal precipitation over Sumatra Island, Indonesia, on synoptic disturbances and its relation to the Madden-Julian Oscillation. *J. Meteor. Soc. Japan*, **99**, 113-137. <http://doi.org/10.2151/jmsj.2021-007>.

Plain Language Summary: Upscale effects of diurnal precipitation over Sumatra on synoptic disturbances are examined. The strong diurnal cycle is followed by the development of synoptic disturbances over the eastern Indian Ocean for several days, and apparent twin synoptic disturbances straddling the equator develop only when the convective center of the Madden–Julian Oscillation (MJO) lies over the Indian Ocean. Furthermore, the MJO events with the strong diurnal cycle tend to have continuing eastward propagation of active convection across the Maritime Continent, suggesting that the strong diurnal cycle facilitate the smooth eastward propagation of the MJO.

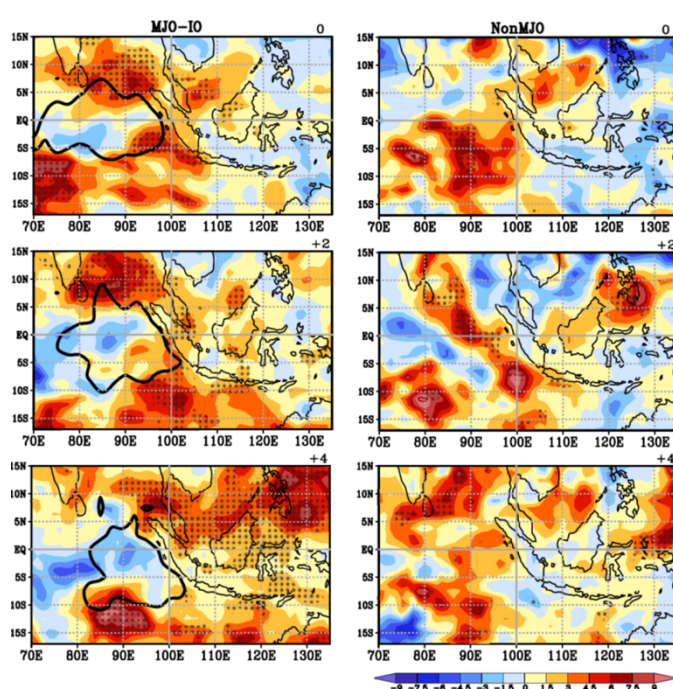


Figure 1. The composite tendency of the eddy kinetic energy at 850 hPa ($10^{-5} \text{ m}^2\text{s}^{-3}$) representing the activity of synoptic disturbances for the strong diurnal events when (left) the MJO is located over the Indian Ocean and (right) the MJO is inactive. Dotted areas represent more than the 95% confidence level. The thick black lines represent the convective envelope of the MJO. The numbers on the top right sides show lags in days from the reference day.

- Synoptic disturbances develop over the Indian Ocean after the strong diurnal cycle over Sumatra, suggesting that the diurnal cycle excites seed disturbances.
- Apparent twin synoptic disturbances straddling the equator develop only when the convective center of the MJO lies over the Indian Ocean.
- The strong diurnal cycle over Sumatra might facilitate the smooth eastward propagation of the MJO across the Maritime Continent.