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MJO and Western Pacific Cyclogenesis

We use the TRMM rainfall data from the NASA Giovanni data base to identify the MJO and equatorial waves for 2003-2007. The wave modes are identified using the time and space filtering similar to the method used by Wheeler and Kiladis (1999) to identify tropical modes in OLR data.

We investigate the waves in the equatorial belt (5S-5N) and in the Northern Tropics (5-15). The analysis shows that precipitation in the both Kelvin waves and westerly waves is enhanced during the MJO. The MJO signal in the Northern Tropics appears about 10 days later relative to equatorial signal. The active MJO phase in the Northern Tropics is associated with intense easterly waves, and Western Pacific (WP) cyclogenesis. Almost all WP cyclones that develop near the equator (5-17N) originate from easterly waves that develop within the MJO envelope. During the spring, some cyclogenesis cases related to the Kelvin equatorial convection can be observed.

It is worth noting, that even in cases when the cyclogenesis takes place after the passage of the MJO active phase, the wave that triggered the cyclone develops during active MJO. We identified only a few cyclogenesis cases during the dry phase.