



Characterising Central Pacific MRG wave activity under different background conditions

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The mixed-Rossby gravity (MRG) waves are known to play a critical role in tropical cyclogenesis and are found to be more active in the central Pacific region. In this study, using analysis based on outgoing longwave radiation (OLR) data from 1979-2017, we delineate the MRG waves based on their amplitude and try to understand the horizontal and vertical structure and propagation characteristics of strong and weak convectively coupled MRG waves in the central Pacific and also examine their dependence on the ocean and atmosphere background state. We find that more than 50% of the MRG wave activity occurs during late boreal summer and fall. Unlike the case of strong MRG waves, a coherent horizontal and vertical phase propagation is not observed for the weak MRG waves in convection and circulation fields. Further analysis based on atmospheric energetics reveal that stronger MRG activity is associated with a stronger conversion of available potential to kinetic energy. In addition, significant extratropical-tropical interactions were also observed in the upper troposphere during periods of strong MRG activity. It was also found that the nature of the ocean-atmosphere background state also modulates the strength of MRG wave activity, with La Nina background state favoring enhanced MRG wave activity in the central Pacific, and the El Nino background state suppressing the wave activity.