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# QBO-modulated deep convection and anomalous meridional circulation

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The impact of the Quasi-Biennial Oscillation (QBO) on the tropopause height (e.g. Collimore et al. 2003) shows some consequences for the longitudinal distribution of deep convection in the Tropics. This results in altered cloud and precipitation patterns and also influences local weather (e.g. Liess & Geller 2012). In our study we show longitudinal differences in tropical deep and shallow convection between the easterly and westerly QBO phase. NCEP's CFSR (Climate System Forecast Reanalysis) cloud top data and deep convection heating data products are analyzed for their distinct response to the QBO phase. Furthermore, Out-going Longwave Radiation (OLR) products were utilized to identify regions of chronic convection using a commonly applied threshold of 240W/m2. Additionally, we validate our findings using precipitation data from GPCP (Global Precipitation Data Project) and brightness temperatures from AIRS (Atmospheric InfraRed Sounder) satellite observations. For chronically convective regions, our results show an increase in convective available potential energy (CAPE) and precipitation during QBO easterly phase compared to QBO westerly phase. Also, the cloud top is found to be higher and consistent with lower OLR indicating stronger deep convection for chronically convective regions during easterly QBO. In order to show the robustness of our findings, we also investigate the impact of El Nino Southern Oscillation (ENSO). Although strong El Nino cases obfuscate the QBO effect on convection, the general impact of ENSO is negligible and particularly robust during La Nina.