



## **Impact of the Madden-Julian oscillation on Rainfall over the South Pacific Convergence Zone**

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Impacts of Madden-Julian oscillation (MJO) on southern summertime rainfall over the south Pacific convergence zone (SPCZ) is investigated. For this, the real-time multivariate daily MJO series 1 (RMM1) and 2 (RMM2) are used to measure the intensity and different phases of the MJO. For rainfall, daily 3B42 TRMM rainfall data are used and composite analysis is done in all eight different phases of the MJO. By analyzing the daily rainfall for the period 1998-2014, it is found that the MJO significantly modulates the distribution of rainfall over the SPCZ region. Multiple regression analysis (daily rainfall regressed with RMM1 and RMM2) shows noticeable impact of the MJO on rainfall over the SPCZ with explained variance of up to 14%. The phase composite analysis shows considerable changes in rainfall over the SPCZ region during the MJO life cycle with episodes of enhanced and suppressed convection. When the MJO is in phase 2,3, and 4 negative rainfall anomalies (up to 6 mm day<sup>-1</sup>) are observed along the SPCZ. While during phase 6,7, and 8, SPCZ experiences positive rainfall anomaly (up to 8 mm day<sup>-1</sup>). Spectral analysis of daily rainfall data over the SPCZ (160E-180E,5S-15S) shows the maximum spectral peak within the range of intraseasonal periods of 30-90 days. This indicates that the intraseasonal variation in rainfall over the SPCZ is typically associated with the MJO.