

The role of the moisture on the occurrences and distribution of the Amazonian mesoscale convective systems

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The mesoscale convective systems (MCSs) are large and long-lived organized cloud systems, which have impacts on climate and weather. Studies on MCSs over the Amazon basin have been driven in recent years. They showed that MCSs occur spreadly during the Amazon's wet season (November to March) when the Intertropical Convergence Zone is toward northern South America. The MCSs occurrence during wet season months has variations very little known. For instance, during January and March, the MCSs occurrence is greater than in February, being March the month with most occurrences. A similar pattern occurs with the monthly precipitation. During the dry season (May to September), the number of MCSs decreases to a minimum in August, the same as precipitation. However, these MCSs are larger than those occurred in the wet season. Why these differences in the MCSs behavior and occurrence happens is an open question and very important for understanding and improving the MCSs simulations over the Amazon basin. Also, we know very few about the MCSs' mechanism of genesis and maintenance over that region, mainly due to the lack of data on the Amazon capable of representing the convection time scale. Recently (Jan. 17th, 2019), the European Centre for Medium-Range Weather Forecasts (ECMWF) turn available the highest spatial and temporal reanalysis data (ERA5; hourly temporal and 0.5° spatial resolutions) for global range and long-term data (since 1979 to the present). Therefore, our objective is to use this dataset to investigate the moisture's role to the MCSs occurrences on the diurnal, seasonal and interannual scales. To achieve it, we will present temporal and spatial statistical analysis in the hourly, monthly, and annual scales, including vertical moisture profiles. The target period is 2000 to 2013 because of this is the same period of the available MCSs climatology by Rehbein et al. (2017). This investigation is complimentary for a major study where the Amazonian MCSs present and future climates are being investigated.

Keywords: Mesoscale convective systems, Moisture, Amazon basin