

Diurnal cycle of rainfall over tropical South America using 3-yr TRMM-PR data

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Three years of Tropical Rainfall Measuring Mission Precipitation Radar (TRMM-PR) data, acquired during the period 01/01/1998 – 31/12/2000 over the tropical South America, were analysed in order to evaluate and model the diurnal cycle of rainfall near the surface. Amplitude and phase of the first harmonic revealed five main centres of high rainfall and the timing of maximum precipitation occurrence. The phase map showed the preferred path of rainfall and suggested that precipitation tends to propagate in bands which originate in the east and west extremes of the Amazon region. The easterly rain bands occur in the same area where squall lines were previously detected and mapped by others. Because there is little reference to the westerly bands in scientific literature, the results presented in this assignment are considered new findings. Those bands originate along the eastern slopes of the Andes Cordillera during the first hours of the day and propagate Northwest-Southeast oriented towards the Central Amazon for up to 18 hours. The results should be considered preliminary rather than definitive due to the low TRMM-PR sampling rate. More studies using ground radar or a longer TRMM-PR time series must be carried out in order to confirm the existence of the westerly propagating systems and shed more light on the results presented by this work.