

2.10 Some dynamical features of the South America Monsoon System and its maintenance during wet and dry seasons.

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Resumo

Monthly latent heating and radiation cooling rates, specific humidity, evaporation rate, rainfall rate, wind velocity (u and v components) in South America were used to explain the origin of rainfall characteristics of the South American Monsoon system (SAMS). The rainfall climatology for the area allowed the identification of two seasons with marked precipitation regimes: a well defined rainy season in December, January and February, such feature is related with the strong diabatic heating occurring during this season, and a dry season in June, July and August, characterized for an intense radiative cooling, which is related with the descent branch of the Hadley cell. Plotting a meridional-vertical and a zonal-vertical section, we can perceive that during the wet-monsoon season a direct thermal circulation, with rising motion in the monsoon region and sinking motion in the Atlantic-East coast is formed. Such thermal cell is maintained mainly by the latent heat released by the robust cumulus-clouds controlled by the South Atlantic Convergence Zone (SACZ) and by the moisture convergence. In the wet-monsoon season, the monsoon region works as a heat source mainly due to the latent heating, and rising motion is needed to balance it. In the Atlantic-East coast the sinking motion balances the radiative cooling. At the end of the work a schematic diagram is made to show how the thermal circulation is formed during the wet-monsoon season and how it is maintained.