

# **Occurrence of upper tropospheric cyclonic vortex in the Southern Hemisphere Magnetic Anomaly region**

Ligia Alves da Silva, Luis Eduardo Antunes Vieira, Alisson Dal Lago

Instituto Nacional de Pesquisas Espaciais (INPE), Divisão de Geofísica Espacial, São Jose dos Campos / SP; Brazil; ([ligia@cptec.inpe.br](mailto:ligia@cptec.inpe.br)- FAX: +55 12 3945 6810)

The upper tropospheric cyclonic vortices are systems of large-scale low pressure, which show closed cyclonic circulation and are formed approximately at 200 hPa. In the Northeast of Brazil, the upper tropospheric cyclonic vortices are mainly observed during the austral summer and are associated to the rainfall inhibition/occurrence. The occurrence and extension seems to be associated to important climatic oscillations such as El Niño-Southern Oscillation (ENSO). Previous studies suggest some mechanisms of formation and that they are associated to the cold fronts, the zone of convergence of the south Atlantic (ZCAS), fort convective activity in the coast of Africa and heating in the southwest of the Saara. In this paper we investigate the occurrence of upper tropospheric cyclonic vortices in the Southern Hemisphere Magnetic Anomaly region during the austral summer (December, January, February and March) from 1994-2001. We used NCEP-NCAR (National Centers for Environmental Prediction–National Centers for Atmosphere Research) reanalysis zonal ( $u$ ) and meridional ( $v$ ) components of the wind, at the level of 200 hPa, and METEOSAT-3 e METEOSAT-5 satellite images in the infrared cannel for the 1994-1996 period and GOES-8 for the 1997-2001 period.