



Moisture Variations during the life cycle of cyclones in the east coast of South America

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Three regions where a maxima in the cyclones frequency occurs through the year is observed in the East coast of South America (coastal regions of Uruguay, south/southeastern Brazil and southeastern Argentina), where local dynamic conditions enhance this phenomena to occur. The importance of the cyclonic activity in this region regards local convection and associated precipitation. Precipitation, fall of temperatures, strong winds and ocean waves associated with storms affect significantly the population of the coastal zones. Three events have been selected (one per each region) to analyze different aspects related to moisture along the life cycle of the structure. The systems were tracked during its life cycle using an algorithm based on the relative vorticity of wind at 10 meters height. Moisture variations for the selected events were computed along the life of the structures implementing a Lagrangian analysis technique. The mean Lagrangian trajectories were obtained for each system using cluster analysis for the set of trajectories computed with the FLEXPART model and ERA-40 data. Surface turbulent fluxes (latent and sensible heat fluxes) were evaluated for each system. The main result of this analysis is the relevant information obtained on the moisture content and variations of air parcels through the life cycle of extratropical cyclones. The present work improves the comprehension of moisture exchange between a cyclone and the surrounding air masses using Lagrangian analysis methods as an alternative to the traditional Eulerian approaches.