



From cyclones to fronts: climatology and role in precipitation for the Southern Hemisphere

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Atmospheric cyclones are considered to be responsible for the day-to-day weather in the extratropics. Within cyclones the most important areas in terms of weather change are associated with the atmospheric fronts. However, most researchers have been working with the cyclones rather than frontal areas due to a greater complexity associated with the identification and tracking of frontal systems. Nevertheless, during the last couple of years some papers on the climatology of objectively identified fronts have been published (Simmonds et al. 2011, Berry et al. 2011). Frontal analysis is now being used to explore the relationship between fronts and precipitation, high winds, evaporation, etc.

In this presentation we will show the climatology of atmospheric fronts identified in the MERRA and ERA-Interim using the method of Simmonds et al. (2011). In contrast with the approach of Berry et al. (2011) this method does not produce artificial 'fronts' around the Antarctic coast line or in other parts of the Southern Hemisphere. Another distinctive feature of this method is that it is possible to track fronts which provide valuable information on the frontal lifecycle. We will further show associations between mobile atmospheric fronts and cyclones

One of the novel results of our research is the attribution of areas of intense precipitation (>75th percentile) to the fronts and cyclones. As will be shown in certain regions of the Southern Ocean a major portion of precipitation is caused by fronts. In high latitudes in SH up to 80% of precipitation falls within cyclones, while in the mid-latitudes from 30 to 70% of intense precipitation occur within frontal areas but outside cyclones.