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Atmospheric Regime Behaviour in the Southern Hemisphere

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The existence of atmospheric regime behaviour has been investigated for the Northern Hemisphere in previous studies by Sempf (2005) and Sempf et al. (2007). Now the same tools have been applied to verify and understand the origins of atmospheric circulation regimes in the Southern Hemisphere using a three layer quasi-geostrophic atmospheric model at horizontal T21 resolution. For this purpose, the thermal and the surface forcings are configured using an iterative tuning procedure to minimize the deviations between NCEP data and model simulations. With this tuning procedure it is possible to get realistic zonal wind profiles for Southern Hemispheric perpetual winter conditions. While the non zonal part of the forcing is tuned, the non-zonal part is adjusted to winter observations in order to achieve time-averaged planetary wave patterns. This simple model is capable of reproducing atmospheric circulation structures and patterns of low-frequency variability with good accuracy relative to observations.The model also shows atmospheric regime behaviour which has been further analysed using different values for the surface friction.