



Cutoff Lows over the Southeast Pacific off the Coast of the Atacama Desert under Present Day Conditions and in the Last Glacial Maximum

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The large-scale climate over the Southeast Pacific off the coast of the Atacama Desert is characterised by low synoptic variability. A rather rare but nonetheless prominent synoptic feature of this region are mid-tropospheric cutoff lows which form off the coast of northern Chile. These cutoff lows may influence the local climate in the Atacama Desert. For example, the March 2015 Atacama flood is associated to such a cutoff low together with a positive sea surface temperature anomaly over the eastern tropical Pacific, and we found evidence that the cutoff lows also impact local wind regimes at different sites of the Atacama Desert.

In this study we aim to investigate the dynamical processes which favour the development of the cutoff lows over the Southeast Pacific. Case studies and composite analyses are performed using ERA-Interim reanalysis to highlight the role of upper-tropospheric jets and Rossby Wave Breaking in the development of the cutoff lows. Further, their occurrence and the associated dynamical processes during the Last Glacial Maximum are analysed, as distinctly more cutoff lows are detected for the Last Glacial Maximum than under present day conditions in two PMIP3 models.