

Strong links between the Southern Hemisphere subtropical ridge and frontal behaviour

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Considerable research activity is presently being directed at diagnosing trends in the Hadley circulations and also the behaviour of frontal systems. These two can be seen to be connection through the requirement of ‘seamless’ meridional energy fluxes across the tropics and the midlatitudes.

We are exploring these relationships in the Southern Hemisphere making use of the ERA-Interim reanalysis and The University of Melbourne frontal analysis scheme (Catto et al., 2015; Hope et al., 2014; Papritz et al., 2014; Rudeva and Simmonds, 2015; Schemm et al., 2015; Simmonds et al., 2012). Figure 1 shows very strong interannual relations between the latitude of the subtropical ridge (STR, an index of the extent of the Hadley cell) and the frequency of strong fronts in the 20-40°S latitude belt. The plots and the associated correlation coefficients point to a very strong interannual relations between these variables.

References

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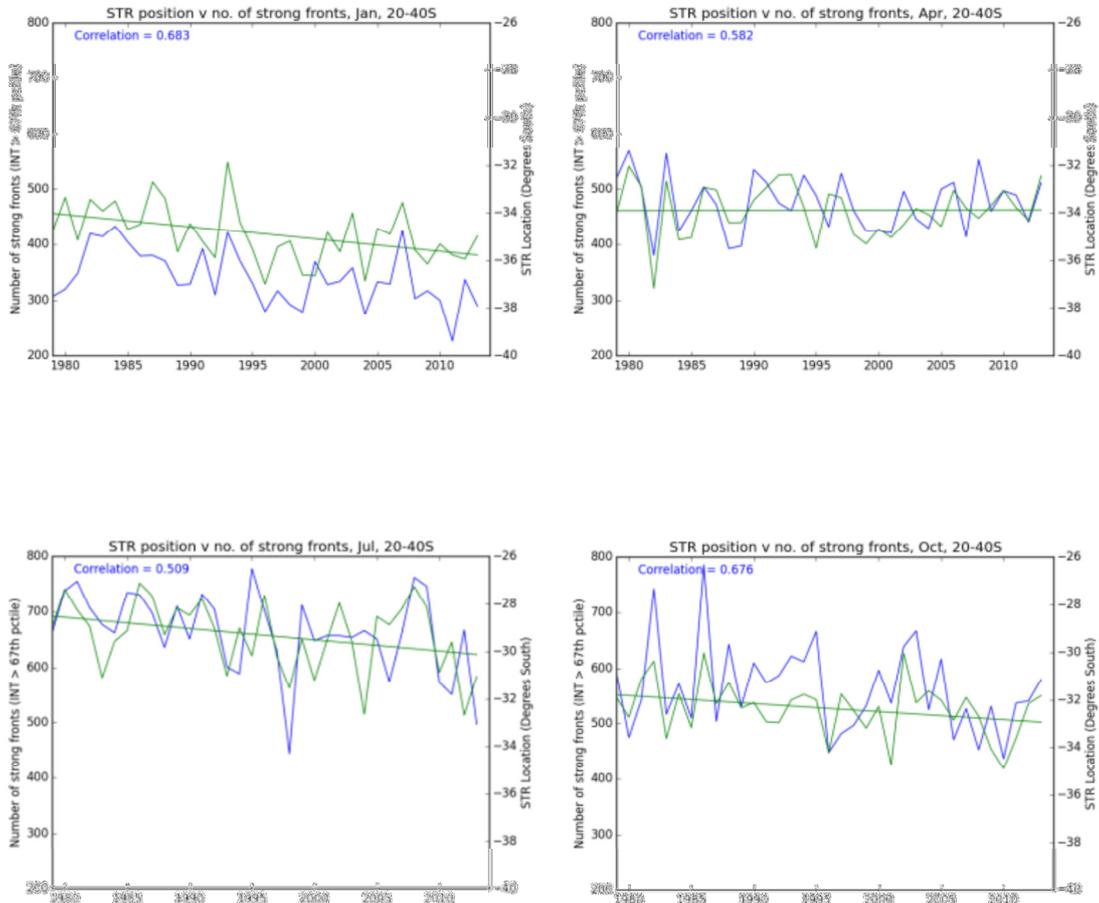


Fig. 1: Time series of the latitude of the Southern Hemisphere STR (green line) and the number of strong fronts lying within 20-40°S (blue line) for January, April, July and October. The (significant) correlations between the time series are 0.68, 0.58, 0.51 and 0.68 for these months, respectively.