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Antarctic Peninsula and Austral Southern South American spring surface temperature characteristics and coupling

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The atmospheric circulation patterns in the Southern Hemisphere undoubtedly has important links with Antarctic climate. Austral Southern South America and Antarctic Peninsula`s surface temperatures are specifically analyzed here, taking into account previous results that have shown a possibly strong influence of a spring circulation pattern linking Antarctica and Southern South America temperatures, primarily along the eastern seaboard. For this purpose, Principal Component Analysis of spring temperature anomalies was performed, considering S and T modes. Results are congruent with previous works, with a common variability mode between Southern South America and Antarctic`s temperatures. Correlation and lagged correlation analysis with climatic indexes were performed to explore the influence of some circulation patterns. The influence of the Southern Oscillation Index is observed in the analysis. The temporal variability of the temperature pattern is also analyzed. While the warming trend in the Antarctic Peninsula over the last 50 years is vastly documented, climate series may exhibit jumps, periodic and quasiperiodic events that do not necessarily last over long periods, but are present over a number of years, then disappearing or remaining as weak signals in the system. The signals (at multiples scales) are analyzed using a wavelet transform. A long term variability mode results evident at the wavelet power spectrum, probably related with the trend present at temperature series. A common variability mode with SOI index appears at a 4-7 year band, which remains active during the positive phase of the PDO. High frequency signals appear in the recent years, since mid 1990's.