



## **Semi-annual to decadal oscillations as recorded at Neumayer research station, Antarctica**

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Monthly time series of temperature, wind speed and sea level pressure recorded at Neumayer polar research station (70°39'S, 8°15'W) during the last 30 years are analysed in order to identify the climate oscillations and associated teleconnection patterns at time scales from half-year to decades. Oscillations with periods of six months (semi-annual) and one year (annual) were identified in all records. Both annual and semi-annual oscillations are non-stationary in time. The dominant pattern of interannual to decadal variability, which captures the out of phase variations of temperature and wind speed with sea level pressure, shows a persistent 2-3 years oscillation. This oscillation is related with a wave-train atmospheric circulation pattern similar to the Pacific South American (PSA) modes. This suggests a tropical origin of this oscillation. The second pattern of interannual to decadal variability, which captures in-phase variations of these variables, shows enhanced variability at 5-6 year time scales. This oscillation is induced by the Antarctic Oscillation (AAO) which shows enhanced variability at these time scales. Analysis of the variability of high resolution stable isotope time series from four ice cores from Neumayer region reveals similar oscillations. This suggests that ice core data from the region could be used to reconstruct the phase and amplitude of atmospheric circulation patterns associated to these oscillations during past periods.