



Climate Patterns and the Forcing of the Polar Stratosphere in Winter

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The temperature and circulation of the high latitude northern hemisphere stratosphere display considerable interannual variability in winter. In some years, like in the mid nineties, the polar stratosphere tended to be very cold, with temperatures low enough for potential formation of polar stratospheric clouds (PSCs). In other winters, like in recent years, warmer temperatures and weaker zonal winds prevailed, and stratospheric sudden warmings were more frequent.

The underlying forcing mechanism presumably originate in the low-frequency variability of the troposphere. We relate the interannual variability of stratospheric parameters, such as PSC volume, polar cap temperature and zonal winds, and wave activity fluxes to tropospheric modes of variability. The climate patterns are derived from an EOF analysis of geopotential height at 500mb, and comprise the NAO, PNA and various blocking patterns. The analysis is carried out with ERA40 re-analyses.