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Ground based monitoring of the stratosphere at Dumont d'Urville, Antarctica

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At the French Antarctic Station in Dumont d'Urville, balloon soundings are performed on a routine basis to get profiles of stratospheric temperature and ozone. In addition, a multiwavelength Rayleigh/Mie/Raman lidar system also allows for measurements of stratospheric temperature, ozone and aerosol density along with characterisation of polar stratospheric clouds (PSC).
The temperature data have been analyzed from 1979 to 2008 with respect to trends revealing a cooling of 0.5 and 1.4 K/decade at 20 km in summer and fall, respectively, and a warming of 1.1 K/decade in spring. Despite the absence of a significant trend in winter, an increase in the occurrence of temperatures below the NAT threshold in the last 20 years is observed.
We further investigate the statistical distribution of the ozone and temperature measurements owing to the fact that, in spring, Dumont d'Urville is located at the vortex edge and hence airmasses inside and outside the vortex are sampled alternatively.
These investigations will contribute to the validation of Climate Chemistry Models.