



## **Monitoring stratospheric chlorine activation from time series of OCIO DSCDs above Kiruna using ground-based zenith sky DOAS observations**

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After to the Montreal protocol and amendments, the production of CFCs was strongly reduced. Since then scientists have steadily made efforts to monitor the amount of chlorine compounds which are responsible for the destruction of ozone in the stratosphere. Although very recent research of stratospheric ozone indicates an ozone recovery, ozone depletion is still observed in the polar spring and is expected to last for about another 70 years according to the WMO. Therefore, continuous observation and analysis of the stratospheric ozone as well as other stratospheric trace gases are highly demanded. Several previous studies have investigated OCIO which is an indicator for stratospheric chlorine activation using satellite, ground-based, and balloon remote sensing measurements.

In this work, we investigate long-term time series of OCIO DSCDs (Differential Slant Column densities) above Kiruna, Sweden (67.84°N, 20.41°E) which is located inside the Arctic Circle by using the ground-based zenith sky DOAS measurements. Since our measurements are performed at the fixed site, for the interpretation also the relative position of the polar vortex has to be considered. Our long-term data obtained during about 15 years allows us to classify the dependence of the OCIO amount on the various meteorological conditions. Our data show a large variability with high OCIO SCDs in cold, and low OCIO SCDs in warm winters. Our measurements also allow to investigate the effect of the chlorine activation and its duration on the strength of the ozone destruction.