Total ozone loss during the 2019/20 Arctic winter and comparison to previous years

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The amplitude of ozone depletion in the Arctic is monitored every year since 1990 by comparison between total ozone measurements of SAOZ / NDACC UV-Vis spectrometers deployed in the Arctic and 3-D chemical transport model simulations in which ozone is considered as a passive tracer.

When SAOZ measurements are missing for various reasons, lack of sunlight, station closed or instrument failure, they are replaced since 2017 by IASI/Metop overpasses above the station. These measurements in the thermal Infrared are available all year around, at all latitudes even in the polar night. IASI data have been compared to SAOZ and to 3-D CTM REPROBUS and the agreement is better than 3% at the latitude of the polar circle.

The method allows determining the evolution of the daily rate of the ozone destruction and the amplitude of the cumulative loss at the end of the winter. The amplitude of the destruction varies between 0-10\% in relatively warm and short vortex duration years up to 25-39\% in colder and longer ones.

Since a strong and large vortex centred at the North Pole, PSCs and activated chlorine are still present at all levels in the lower stratosphere on January 9, 2020, there is a good probability that a significant O\textsubscript{3} loss may happen in 2020. But since, as shown by the unprecedented depletion of 39\% in 2010/11, the loss depends on the vortex duration, strength and possible re-noxification, it is difficult to predict in advance the amplitude of the cumulative loss at the end of the winter.

Shown in this presentation will be the evolution of ozone loss and re-noxification in the Arctic vortex during the winter 2019/20 compared to previous winters and REPROBUS and SLIMCAT CTM simulations.