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Measured and modelled trends of stratospheric Cly and Fy column amounts in the northern hemisphere

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Reactive inorganic chlorine plays a crucial role in the stratospheric ozone depletion. To stabilize and enable a recovering of the stratospheric ozone layer, the Montreal protocol and its amendments and adjustments have been progressively implemented to reduce or even stop the production and emission of important chlorinated source gases (CFCs, HCFCs, CCl₄, CH₃CCl₃, and Halons). As these source gases are photolysed in the stratosphere into inorganic chlorine and fluorine, respectively, the turn over of the inorganic chlorine (HCl and ClONO₂) and slowing down of fluorine (HF and COF₂) reservoirs act as a verification of the effectiveness of these protocols.

Here we present results of long-term measurements of the stratospheric column of HCl, ClONO₂, and HF obtained at different stations in the northern hemisphere (Ny Alesund, Kiruna, Zugspitze, Jungfrauoch, Izana, all affiliated to the Network for the Detection of Atmospheric Composition Change (NDACC) within the Pole-Equator-Pole (PEP) network. These time series are interpreted with model calculations performed with a state of the art 2-D model and the 3-D CTM KASIMA with respect to the determination of the slowing down or turn over, respectively. In addition, trend parameters will be presented and intercompared.