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Partitioning between the inorganic chlorine reservoirs HCl and $ClONO_2$ during the Arctic winter 2005 from the ACE-FTS

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Abstract. From January to March 2005, the Atmospheric Chemistry Experiment high resolution Fourier transform spectrometer (ACE-FTS) on SCISAT-1 measured many of the changes occurring in the Arctic (50–80° N) lower stratosphere under very cold winter conditions. Here we focus on the partitioning between the inorganic chlorine reservoirs HCl and $ClONO_2$ and their activation into ClO. The simultaneous measurement of these species by the ACE-FTS provides the data needed to follow chlorine activation during the Arctic winter and the recovery of the Cl-reservoir species $ClONO_2$ and HCl. The time evolution of HCl, $ClONO_2$ and ClO as well as the partitioning between the two reservoir molecules agrees well with previous observations and with our current understanding of chlorine activation during Arctic winter. The results of a chemical box model are also compared with the ACE-FTS measurements and are generally consistent with the measurements.

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