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Balloon-Borne In-situ Measurements of ClO and ClO Dimer in the Artic Polar Vortex

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In the frame of the project ENVIVAL-LIFE concerned about the lifetime validation of the ENVISAT atmospheric sensors a stratospheric balloon flight into the arctic vortex will take place in the February/March 2009 time period from ESRANGE near Kiruna, Sweden. The payload consists of an in-situ instrument to measure ClO, ClO dimer, and BrO and a whole air sampler to provide stable trace gas measurements. This flight will enable the first profile measurement over an extended altitude range extending from 15 up to around 30km of the ClO/ClO dimer partitioning under equilibrium (night-time) conditions and low solar zenith angles. The measurements will yield new data especially with respect to the pressure dependence of the ClO_x partitioning in the arctic vortex and may therefore provide a sensitive test data set for intercomparison with chemical process models.

Preliminary results of the measurements, intercomparisons with CLAMS (Chemical Lagrangian Model of the Stratosphere) simulations along air mass trajectories, and the possible relevance for the highly debated ClO_x partitioning will be discussed.