A climatology of PSC composition for the northern and southern hemisphere from 2002 and 2012 observed by MIPAS/Envisat

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The MIPAS instrument onboard the ESA Envisat satellite operated from July 2002 until April 2012. The infrared limb emission measurements represent a unique dataset of day and night observations of polar stratospheric clouds (PSCs) up to both poles. Cloud detection sensitivity is comparable to spaceborne lidars, and it is possible to classify different cloud types from the spectral measurements in different atmospheric window regions.

Results of a new PSC classification scheme will be presented by combining a well-established two-colour ratio method and multiple 2D brightness temperature difference probability density functions. The method is a simple probabilistic classifier based on Bayes' theorem with a strong independence assumption. The Bayesian classifier distinguishes between solid particles of ice and nitric acid trihydrate (NAT), as well as liquid droplets of super-cooled ternary solution (STS).

The spatial, intra-seasonal, and inter-annual variation in the PSC type occurrence have been analysed. The MIPAS PSC climatology can be used to validate the PSC schemes of chemical transport and chemistry climate models. Higher level data products retrieved from the climatology, like Volume and Area PSC (V_{PSC} and A_{PSC}), frequently used as a proxy for ozone depletion, will be investigated in comparison with model results of the Chemical Lagrangian Model for the Stratosphere (CLaMS).

The analysis of mountain wave (MW) induced formation of NAT clouds based on measurements of the nadir looking AIRS instrument and the MIPAS climatology will be presented focusing on both hemispheres, the complete season of PSC activity, and specific years.