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## Distinction between clouds and ice/snow covered surfaces in the identification of cloud-free observations using SCIAMACHY PMDs

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**Abstract.** SCIAMACHY on ENVISAT allows measurement of different trace gases including those most abundant in the troposphere (e.g. CO<sub>2</sub>, NO<sub>2</sub>, CH<sub>4</sub>, BrO, SO<sub>2</sub>). However, clouds in the observed scenes can severely hinder the observation of tropospheric gases. Several cloud detection algorithms have been developed for GOME on ERS-2 which can be applied to SCIAMACHY. The GOME cloud algorithms, however, suffer from the inadequacy of not being able to distinguish between clouds and ice/snow covered surfaces because GOME only covers the UV, VIS and part of the NIR wavelength range (240-790 nm). As a result these areas are always flagged as clouded, and therefore often not used. Here a method is presented which uses the SCIAMACHY measurements in the wavelength range between 450 nm and 1.6 μm to make a distinction between clouds and ice/snow covered surfaces. The algorithm is developed using collocated MODIS observations. The algorithm presented here is specifically developed to identify cloud-free SCIAMACHY observations. The SCIAMACHY Polarisation Measurement Devices (PMDs) are used for this purpose because they provide higher spatial resolution compared to the main spectrometer measurements.

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