



## **The determination of cloud fraction in SCIAMACHY pixels using MERIS measurements**

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Since clouds play an essential role in the Earth's climate system, it is important to understand the cloud characteristics as well as their distribution on a global scale using satellite observations. One of the main scientific objectives of SCIAMACHY (SCanning Imaging Absorption spectroMeter for Atmospheric CHartographY) on ENVISAT is the retrieval of cloud parameters which are also relevant for the study of tropospheric constituents.

On the one hand, SCIAMACHY has to be sensitive to low variations in trace gas concentrations which means the ground pixel size has to be large enough. On the other hand, such a large pixel size leads to the problem that SCIAMACHY spectra are not well suitable to derive a reliable cloud fraction that can be used as input parameter for subsequent retrievals of cloud properties or vertical trace gas columns. Therefore, we use MERIS/ENVISAT spectral measurements with its high spatial resolution as sub-pixel information for the determination of MerIS Cloud fRation fOr Sciamachy (MICROS). Since MERIS covers an even broader swath width than SCIAMACHY, no problems with spatial and temporal matches of measurements occur. This enables the derivation of a SCIAMACHY cloud fraction with an accuracy much higher as compared with other current cloud fractions that are based on SCIAMACHY's PMD (Polarization Measurement Device) data.

We present our new developed MICROS algorithm based on the threshold approach as well as a qualitative validation of our results with MERIS satellite imageries for different locations, especially with respect to bright surfaces such as snow/ice and sands. In addition, the SCIAMACHY cloud fractions derived from MICROS are intercompared with other current SCIAMACHY cloud fractions based on different approaches demonstrating a considerable improvement regarding "true" cloud fraction determination using the MICROS algorithm.