



## **Validation of cloud geometrical thickness retrieved from Meteosat-8/SEVIRI for stratocumulus clouds**

**S.Placidi** (1), R.A.Roebeling (2), D.P.Donovan (2), H.W.J.Russchenberg (1) and R.Boers (2)

(1) International Research Centre for Telecommunication and Radar (IRCTR), Delft University of Technology, The Netherlands (simoneplacidi@gmail.com), (2) Royal Netherlands Meteorological Institute (KNMI), De Bilt, The Netherlands

Satellite derived information on cloud optical thickness and effective radius may be used for the simultaneous retrieval of cloud geometrical thickness and droplet concentration. The latter two cloud properties are mandatory for the monitoring of the first indirect aerosol effect. The spectral and high temporal resolution of Meteosat-8/SEVIRI allows, for the first time, the generation of a statistically significant dataset of cloud droplet concentration and geometrical thickness for validation with ground-based observation. A new algorithm "Satellite monitoring of the first indirect aerosol effect: Retrieval of the droplet concentration of water clouds" (Boers et al., 2006) has been applied to Meteosat-8/SEVIRI measurements. This algorithm is applicable for single-layered water clouds assuming quasi-adiabatic vertical profiles of the liquid water content. The essential point is that effective radius and optical thickness are functions of the droplet concentration and the geometrical thickness. Validation of the retrieved geometrical thickness has been carried out by comparing satellite retrievals with ground-based measurements obtained during the Cloudnet ([www.cloud-net.org](http://www.cloud-net.org)) project for CESAR site in The Netherlands. Five cases with two-hundred data points have been analysed. The ground-based cloud geometrical thickness is calculated using combined lidar and radar data with a vertical resolution of 90 meters. The results show a very good agreement between SEVIRI and ground-based retrievals of geometrical thickness, with a correlation of about 86% and a RMS of differences of about 170 meters. Further investigations are focussing on comparing the cloud geometrical thickness and liquid water path retrieved from Meteosat-8/SEVIRI with ground-based measurements for two other sites as Chilbolton in UK and Palaiseau in France.