



Theoretical basis and preliminary results from the Solar Insolation under Cloudy Conditions from Satellite (SICCS) retrieval

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The SEVIRI instrument on-board MSG continuously acquires multi-spectral satellite data of Europe at high temporal and spatial resolution, offering unique opportunities for the monitoring of cloud and radiation parameters for this continent.

Within the SICCS project, a retrieval has been implemented and evaluated to operationally derive the solar insolation at the surface with full SEVIRI resolution in near-real time. In contrast to other algorithms, clouds are represented explicitly by their physical properties optical depth, effective radius and thermodynamic phase. Together with supplementary information on water vapour column and surface albedo, an accurate estimate of the solar insolation and its variability induced by clouds is possible.

The retrieval is evaluated by a comparison with 1 year of data from 32 operational measurement stations throughout the Netherlands, as well as the Cabauw BSRN station to quantify its accuracy. The magnitude of observed errors and expected uncertainties are compared and discussed. The explicit representation of clouds also allows conclusions about the sensitivity of the solar insolation to physical cloud properties.