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Global long-term cloud properties from multi-platform radiances in the O_2 A-Band

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The determination of cloud properties is essential in the assessment of the Earth's radiative forcing and calculation of trace-gases columns. The characterization of their spatial and temporal behavior can be achieved combining radiances derived from different instruments. Therefore datasets from GOME-1 (ERS-2), GOME-2 (MetOp-A) and SCIAMACHY (ENVISAT) are injected in SACURA (Semi-Analytical CloUd Retrieval Algorithm) and cloud top altitude and albedo as well as cloud optical thickness are retrieved.
The minimization method of SACURA exploits the absorption of oxygen in the near-infrared. Partially cloudy scenes have been considered under the independent pixel approximation for GOME-1 and SCIAMACHY, whereas for GOME-2 only fully cloudy scenes are considered. Moreover a combination of analytical and Look-Up-Table approaches in the retrieval procedure enables the treatment of both thick (optical depth >5) and thin (<5) clouds.
The ancillary informations for surface albedo and cloud fraction are taken respectively from the TEMIS ground reflectance database - by KNMI - and from OCRA (Optical Cloud Recognition Algorithm) - by DLR (Deutsches Zentrum für Luft- und Raumfahrt). Both datasets are derived from GOME-1 data, therefore ensuring self-consistency, at least for one case.
The detailed error and sensitivity analysis of the cloud properties above mentioned for several scenarios and the qualitative comparison with the cloud top height from ATSR-2 (Along Track Scanning Radiometer) are presented.