



The Operational Sentinel-5 Precursor Cloud Products: Status, Statistics, Applications and Comparisons

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The Copernicus mission Sentinel-5 Precursor is focused on trace gas, aerosol and cloud retrieval and operates in the UV/VIS/NIR/SWIR spectral region.

In this work we present the algorithms for retrieving the operational cloud products from TROPOMI onboard Sentinel-5 Precursor. The cloud retrieval algorithms OCRA (Optical Cloud Recognition Algorithm) and ROCINN (Retrieval of Cloud Information using Neural Networks) have their heritage with GOME/ERS-2 and GOME-2 MetOp-A/B, where they have already been successfully implemented in an operational environment.

OCRA employs a broad band color space approach and, in combination with a set of cloud-free reflectance background composite maps, determines a radiometric cloud fraction by making use of the assumption that clouds usually have a higher reflectance than the surrounding surface and that the cloud reflectance is almost wavelength independent across the UV/VIS/NIR wavelength region. The ROCINN algorithm retrieves cloud top height, cloud optical thickness and cloud albedo from NIR measurements in and around the oxygen A-band, taking as a priori input the cloud fraction computed by OCRA.

The cloud parameters retrieved by ROCINN are provided for two different cloud models. One which treats clouds more realistically as layers of scattering water droplets (clouds-as-layers, CAL) and one which treats clouds as simple Lambertian reflectors (clouds-as-reflecting boundaries, CRB).

The current implementation status and setup of the algorithms is presented along with monthly statistics for the cloud parameters, individual application examples as well as satellite-to-satellite comparisons with VIIRS on Suomi-NPP.