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The Operational Cloud Products for Sentinel-5 Precursor and Sentinel-4

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Sentinel-5 Precursor and Sentinel-4 are atmospheric Copernicus missions focused on trace gas, greenhouse gas, aerosol and cloud retrieval and operate in the UV/VIS/NIR/(SWIR) spectral region. A key ingredient for the retrieval of the aforementioned trace gases and greenhouse gases is a precise knowledge of the presence of clouds. On top of that, clouds are by themselves interesting to measure and monitor because of their contribution to the radiation budget, and hence, impact on climatological applications. In this contribution, we present the algorithms for retrieving the operational cloud products from TROPOMI onboard Sentinel-5 Precursor and the UVN spectrometer onboard Sentinel-4. These are called OCRA (Optical Cloud Recognition Algorithm) and ROCINN (Retrieval of Cloud Information using Neural Networks) and both have their heritage with GOME/ERS-2 and GOME-2 MetOp-A/B/C, where they have already been successfully implemented in an operational environment.

OCRA employs a broad band color space approach to determine a radiometric cloud fraction and ROCINN 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 status of the algorithms is presented along with recent developments and improvements.