



SERVE: Sentinel-5P Earth Reflectance Validation Experiment – First Light Results

Ping Wang, L. Gijsbert Tilstra, Martin de Graaf, Maarten Sneep, and Piet Stammes

Royal Netherlands Meteorological Institute (KNMI), R&D Satellite Observations Department, De Bilt, Netherlands
(stammes@knmi.nl)

Accurate radiometric calibration of the TROPOMI Level-1b (L1b) data is important for the retrieval of atmospheric and surface Level-2 products from TROPOMI, especially aerosol and cloud products, ozone profiles, and surface albedo. High absolute radiometric accuracy of TROPOMI is important for climate applications of the L1b data, and for continuity of Sentinel-5P in the comparison with OMI, SCIAMACHY and GOME-2, towards Sentinel-5. Based on our experience with in-flight L1b verification and validation for GOME, SCIAMACHY, OMI, and GOME-2 of UV-VIS reflectances, we plan to validate the reflectances of TROPOMI.

The approach for the verification and validation of the L1 data is to compare the L1b reflectances with simulated reflectances using the Doubling-Adding KNMI radiative transfer model. With carefully selected scenes and high quality auxiliary data, this method can achieve an accuracy of a few percent (3-5%) for the calibration. In order to get the best accuracy and more confidence, the project will be carried out using three independent data sets: (1) selected target scenes, (2) global cloud-free data, and (3) field campaign measurements.

We have selected a set of TROPOMI L1b data to check the quality. The selected L1b reflectances have been compared with the DAK simulations. Another way of checking the L1b calibration is through verification of the L2 products, such as Absorbing Aerosol index and cloud retrievals. First results related to the TROPOMI L1b validation will be shown.