An overview of the S5P/TROPOMI level 2 file format

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On 13th October 2017 Sentinel 5 precursor (S5P) with on board the TROPOspheric Monitoring Instrument (TROPOMI) was launched from Plesetsk Cosmodrome in Russia. TROPOMI is a successor to OMI, using the same measurement principle with a 2-dimensional detector, one for the different viewing directions across the flight direction, the other dimension for the wavelength separation. TROPOMI is also the successor to GOME-2/SCIAMACHY, since it also covers the NIR and SWIR spectral regions. The spectral resolution is comparable to that of OMI, the signal to noise ratio is significantly improved compared to GOME-2 or OMI. The spatial resolution is much higher, with an approximate nadir pixel size of 3.5 km by 7 km and about 14 km by 9 km at the edge of the swath. S5P will fly in loose formation with Suomi-NPP to use the NPP-VIIRS cloud mask for cloud screening in aerosol and methane processing.

This combination of improvements means that the number of ground-pixels is about 12 and 100 times higher than that of OMI and GOME-2, respectively. The total data volume is about 60 GB per orbit for level 1B (split into 8 files, one for each band plus 2 files for the daily solar observation), and about 8 GB per orbit for level 2 (split into several products/files).

This new instrument provides an opportunity to redefine the S5P/TROPOMI level 2 (L2) file format itself. This work gives an overview of the choices the L2 teams have made and some of the finer details the end users want to be aware when using the L2 files. This file format also incorporates the lessons learnt from the experience with the definition of the GOME-2 and OMI L2 and level 1B products. We will discuss the basic format, the file structure and especially the included metadata as well as the involved conventions and standards while defining the S5P/TROPOMI L2 products. The new L2 file format was developed to generate a standard format and naming scheme for all atmospheric Sentinel missions in order to facilitate the usage of the data from different instruments and satellites. The L2 file format for the upcoming atmospheric missions of Sentinel 4 (S4) and Sentinel 5 (S5) will be indeed harmonized with the S5P/TROPOMI L2 format as far as possible.