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The Copernicus Atmospheric Sentinel Missions S-5p, S-4 and S-5

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The European Copernicus programme includes 2 series of space instruments observing atmospheric composition: the Sentinel-4 mission will monitor regional air quality, in particular including its diurnal variation, from geostationary orbit using a UV-visible-near IR spectrometer (UVN), complemented by a thermal IR spectrometer and an imager; the Sentinel-5 mission will observe atmospheric composition in support of global air quality, climate assessments, stratospheric ozone and surface UV applications, exploiting a UV-visible-near IR-shortwave IR spectrometer (UVNS), in conjunction with a thermal IR spectrometer, a multispectral imager and a polarisation imager, from low Earth orbit. The dedicated Copernicus instruments UVN and UVNS will fly on Eumetsat's new meteorological platforms MTG-S and Metop-SG, allowing for synergistic exploitation of data from the co-flying spectrometers and imagers. To bridge the data gap with Envisat and EOS-Aura, Sentinel-5 will be preceded by a slightly simplified instrument ("Sentinel-5 precursor" S-5p), flying on a dedicated satellite in loose formation with NASA's Suomi-NPP.
Sentinel-4 and -5p are currently in the development phase; in parallel the ground segment algorithms and processors are being shaped. The algorithms for S-5p Level 2 products have been reviewed and are now being implemented in the operational processor. A call for S-5p calibration and validation activities has been issued and proposals have been reviewed. A campaign has taken place to prepare for the geophysical validation of S-5p data products. The S-4 Level 2 prototype development is going to start soon. Sentinel-5 is finishing the detailed design phase, the observation requirements have been consolidated. The selection of geophysical data products is being finalised.
This paper will provide an overview of the main characteristics and status of the atmospheric Sentinel missions and the on-going scientific preparatory activities.