



## Atmospheric composition observation by Sentinel-4 and -5

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The Copernicus missions Sentinel-4 (S4), Sentinel-5 (S5), and the Sentinel-5 Precursor (S5P) are dedicated to atmospheric composition and have been designed to serve the specific needs of the Copernicus Atmosphere Monitoring Service (CAMS). This presentation focuses on the S4 and S5 missions.

The atmospheric Sentinels have been conceived as elements of a constellation with complementary observational capabilities. The geostationary S4 mission will provide tropospheric composition data over Europe with hourly revisit time mainly for air quality applications. The target species of the Sentinel-4 mission include the key air quality parameters with pronounced temporal variability such as NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, HCHO, CHOCHO, and aerosols. The low-Earth orbit missions, S5 and S5P, will provide composition data with global coverage on a daily basis serving climate, air quality, and ozone/surface UV applications. The S5 and S5P target species include the S4 target species plus longer lived components such as CO, CH<sub>4</sub>, and stratospheric O<sub>3</sub>. The space component of the atmospheric Sentinels builds on heritage from instruments such as GOME, SCIAMACHY, GOME-2, and OMI and comprises imaging spectrometer instruments with significantly enhanced spatial resolution. While the S4 instrument covers the Ultra-violet, Visible, and Near infrared spectral range (S4/UVN) the S5 instrument covers additionally the Short wave infrared (S5/UVNS). S5 will be preceded by the S5P (S5 Precursor) mission that will bridge the data gap between OMI and S5. S4 establishes the European component of a constellation of geostationary instruments with similar observational capabilities together with the NASA mission TEMPO and the Korean mission GEMS.

ESA is responsible for the development of the protoflight models and the recurrent units of the S4/UVN and the S5/UVNS instruments and their payload data processors. For S4 and S5, the instruments and the Level-1b prototype processors are being built by a consortium led by Airbus Defence and Space. Consortia led by DLR and S&T are developing respectively the S4 Level-2 operational processor and the S5 Level-2 prototype processor. The S4/UVN instruments will be embarked on the Meteosat Third Generation-Sounder (MTG-S) platforms. Two S4/UVN instruments will be flown in sequence spanning an expected mission lifetime of 15 years. The S5/UVNS instruments will be embarked on the MetOp-Second Generation (MetOp-SG) satellite A platforms. Three S5/UVNS instruments will be flown in sequence spanning an expected mission lifetime of 21 years. The Flight Acceptance Reviews of the first MetOp-SG and MTG-S satellites are expected to take place in 2021 and 2022, respectively. EUMETSAT will operate the S4/UVN and S5/UVNS instruments and will process the mission data up to Level-2.

An overview of the atmospheric composition capability of the two complementing missions will be presented.