Sentinel-4 Instrument Data Simulator

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The Sentinel-4 (S4) mission, the first imaging spectrometer instrument to be flown on Meteosat Third Generation Sounding (MTG-S) satellite in geostationary orbit, will provide accurate data on an hourly basis of trace gases and aerosols over Europe and Northern Africa for climate, air quality, ozone and surface UV applications. It features bands in the ultraviolet (305-400 nm), and visible (400-500 nm) with a spectral resolution of 0.5 nm and in the near-infrared (750-775 nm) ranges with a spectral resolution of 0.12 nm.

To provide simulated S4-UVN instrument data, we are working to prepare the Instrument Data Simulator (IDS). IDS is supposed to provide test data for the L1b Processor and provide capability for instrument performance and calibration monitoring. The IDS consists of two main blocks: the Scene Generator (SG) simulates the radiance/irradiance at the entrance of the instrument and the Instrument Simulator (IS) simulates the response of the instrument on the input signal. The S4-UVN IS follows as much as possible the instrument forward model and will be developed using a 'travelling spectrum' approach. In this approach, the flux in the instrument or signal and noise is modified step-by-step by a series of algorithms representing the effects of the different components of the instrument on signal when flowing through the instrument. The IDS architecture, instrument forward model and the preliminary output of IDS will be introduced.