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ESA's Ice Cloud Imager on Metop Second Generation

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Since 2006, the European contribution to operational meteorological observations from polar orbit has been provided by the Meteorological Operational (MetOp) satellites, which is the space segment of the EUMETSAT Polar System (EPS). The first MetOp satellite was launched in 2006, 2nd 2012 and 3rd satellite is planned for launch in 2018.
As part of the next generation EUMETSAT Polar System (EPS-SG), the MetOp Second Generation (MetOp-SG) satellites will provide continuity and enhancement of these observations in the 2021 – 2042 timeframe.
The noel Ice Cloud Imager (ICI) is one of the instruments selected to be on-board the MetOp-SG satellite "B".
The main objective of the ICI is to enable cloud ice retrieval, with emphasis on cirrus clouds. ICI will provide information on cloud ice mean altitude, cloud ice water path and cloud ice effective radius. In addition, it will provide water vapour profile measurement capability.
ICI is a 13-channel microwave/sub-millimetre wave radiometer, covering the frequency range from 183 GHz up to 664 GHz.
The instrument is composed of a rotating part and a fixed part. The rotating part includes the main antenna, the feed assembly and the receiver electronics. The fixed part contains the hot calibration target, the reflector for viewing the cold sky and the electronics for the instrument control and interface with the platform. Between the fixed and the rotating part is the scan mechanism. Scan mechanism is not only responsible of rotating the instrument and providing its angular position, but it will also have pass through the power and data lines. The Scan mechanism is controlled by the fully redundant Control and Drive Electronics
ICI is calibrated using an internal hot target and a cold sky mirror, which are viewed once per rotation. The internal hot target is a traditional pyramidal target. The hot target is covered by an annular shield during rotation with only a small opening for the feed horns to guarantee a stable environment. Also, in order to achieve very good radiometric accuracy and stability, the ICI instrument is designed with sun-shields in order to minimize sun-intrusion at all possible sun angles.
Details of the instrument design and the current development status will be presented.