

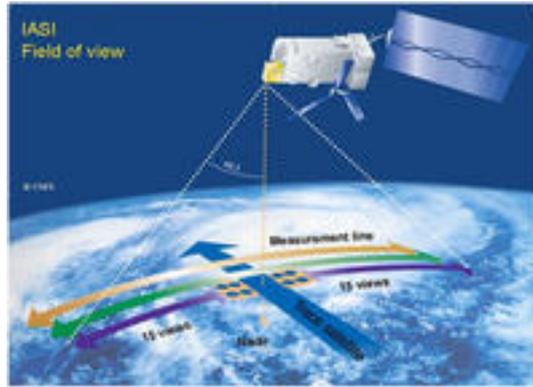
# IASI

## Infrared Atmospheric Sounding Interferometer

The IASI instrument was designed by the Centre National d'Etudes Spatiales (CNES) for weather forecasting and for the monitoring of atmospheric composition. It is based on a Michelson interferometer that uses the nadir geometry to record the changes in the radiation emitted by the Earth's surface due to absorption gases along the optical path. The instrument provides radiance measurements from which profiles of temperature and water vapor can be retrieved, as well as concentrations for atmospheric constituents that absorb in the infrared spectral range, along with characteristics of clouds, surface (emissivity and temperatures), and aerosols.

IASI is part of the payload of the MetOp-A satellite, which was launched on October 19, 2006 on a polar orbit by EUMETSAT at an altitude of about 817 km, and which provides two overpasses per day (around 9:30 am and 21:30 local time). The instrument covers the thermal infrared spectral range with a good spectral resolution (apodized 0.5 cm<sup>-1</sup>) and excellent radiometric performances in the longer wavelengths, making it an advanced vertical sounder for the study of atmospheric chemistry and climate. The mission is scheduled to last 15 years (three successive IASI, the next launch is scheduled current 2012). The continuation of the IASI program is being prepared, with a concept of an improved instrument (IASI-NG) proposed by French scientists in collaboration with CNES and Eumetsat for the Post-EPS/Sentinel 5 payload (launch in 2019). The research work performed at IPSL using IASI data covers many areas: monitoring of changes in greenhouse gas concentrations, monitoring and forecast of pollution episodes, characterization and study of the composition of fire plumes, improved emission inventories, aerosol characterization and monitoring of plumes consecutive to volcanic eruptions. IPSL also provides products in near real time for the European GMES Program (MACC project). Theoretical work related to IASI is conducted at IPSL on spectroscopic data (database GEISA - LMD / ARA and Ether / IPSL) and activities related to calibration / validation (balloon, ground-based, and other satellites) are organized. This research is based on IASI radiance data made available through the Ether database, and relies on computing facility available at IPSL (Ciclad) or at CNRS (IDRIS). The results obtained during the first year of operation of IASI data have been gathered in a special edition of the ACP journal. More than half of the papers are with researchers whom belong to IPSL, from LATMOS, from LMD, from LISA, from LSCE and from LPMAA.

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IASI instrument on board the MetOp satellite

**Laboratory :**