IASI on Metop: an Advanced Sounder for Operational Meteorology and Climate studies.

T. Phulpin, G. Chalon and D. Blumstein
Centre National d'Etudes Spatiales

IASI is a new generation infrared vertical sounder developed jointly by CNES and EUMETSAT that will be embarked on METOP 1 to 3. It has been designed for operational meteorological soundings with a very high level of accuracy (Specifications on Temperature accuracy: 1K for 1 km and 10% for humidity) and also for estimating and monitoring trace gases on a global scale. The IASI system includes the 3 instruments, a data processing software integrated in the EPS ground segment and a technical expertise centre (TEC) implemented in CNES Toulouse.

The instrument is composed of a Fourier transform spectrometer and an associated infrared imager. The optical configuration is based on a Michelson interferometer and the interferograms are processed by an on-board digital processing subsystem, which performs the inverse Fourier transforms and the radiometric calibration. The infrared imager co-registers the IASI soundings with AVHRR imager (AVHRR is another instrument on the Metop satellite). The first flight model has just been delivered by the prime Alcatel to be integrated in the next months on METOP 1. Its radiometric performances are compared to its specifications.

The operational software for level 1 and level 2 is currently under development respectively under CNES and Eumetsat responsibility. The Level 1 processing is devoted to deliver to end users very well calibrated and located radiance spectra. Its functions and parameters will be established, monitored and updated by the TEC. A calibration/validation plan to ascertain level 1 data quality has been defined.

Based on actual current instrument performances, simulations performed in the framework of preparatory studies by the IASI sounding study working group (ISSWG) show that with the current assimilation or inversion techniques, mission requirements are met.