

# SPIR Notes

**Special Projects in Radiometry (SPIR)** is a division dedicated to providing turnkey systems in spectral radiometry and optical remote-sensing instrumentation. Our team includes over 80 highly qualified engineers, scientists and technicians.

**Expanding ABB Bomem's excellence in building state-of-the-art instruments**

- Optical instruments for use on aircrafts, balloons or satellites
- Hyperspectral imagers
- Optical calibration systems
- Software for data processing and instrument modeling

## MIPAS Optical Calibration Systems

The Michelson Interferometer for Passive Atmospheric Sounding (**MIPAS**), developed for the European Space Agency (ESA), will fly on the Envisat-1 platform.

The Engineering department of ABB produced two optical calibration systems for the MIPAS project.

The Optical Calibration Facility (OCF) allows the calibration and characterization of the MIPAS instrument. The OCF includes two separate cryostats mounted on the MIPAS test chamber (See). The first cryostat holds a large area cryogenic blackbody used as a reference infrared source, in the spectral range 600 to 2500  $\text{cm}^{-1}$ , adjustable from 100 K to 250 K.

The second cryostat contains a collimator system composed of an illuminator at ambient pressure and temperature enclosed in a nitrogen purge cover, a cryogenic illuminator and a cryogenic collimator both kept under vacuum and cooled to liquid nitrogen. The warm illuminator comprises a hot blackbody source, a filter wheel, a chopper, and a gas cell. The cryogenic illuminator includes a second filter wheel, and a translation stage holding different apertures as well as an infrared detector.

The OCF has its own controller developed at ABB and operated by software coded in C.

The Interferometer Optical Ground Support Equipment (IOGSE) is an optical test system intended to the characterization of the interferometer module of the MIPAS instrument. It consists of a source module and two interchangeable detector modules. The source module includes a collimator system, a hot blackbody source, two optical filter wheels, an optical beam chopper and a gas cell with its gas supply system.



Figure 1: The MIPAS Optical Calibration Facility



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