

# 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

## MOPITT Optical Calibration Sources

MOPITT, the instrument for Measurement of Pollution In The Troposphere developed for the Canadian Space Agency (CSA) as part of NASA's Earth Observation System (EOS) Terra platform.

The Engineering department of ABB produced the in-flight calibration sources of the MOPITT instrument as well as a ground calibration target.

The MOPITT on-board calibration sources are four compact high emissivity cavities mounted on the MOPITT instrument and working in the 285 K to 500 K temperature range. Each source is a cylindrical cavity ended with a cone shape, coated on the inside with Enhanced Martin Black, thermally insulated and equipped with heaters and PRT's.

ABB delivered the four sources to the instrument prime contractor for their integration and test. The MOPITT instrument was then integrated on the Terra platform. The Terra platform was launched in December 1999 and MOPITT has been operating successfully ever since.

The MOPITT ground calibration sources are two high precision blackbodies used in the testing of the integrated instrument. The first blackbody is a multi-aperture cryogenic device operating below 80K. The pyramid arrays covered with a diffuse paint produce the desired high emissivity. The second source is adjustable in temperature from 230 K to 520 K using either a fluid or heaters on the cavity. The high emissivity results from the cavity geometry and graphite paint. Both sources operated successfully at the University of Toronto for the testing of the different MOPITT instrument models.



Figure 1 : One of the four MOPITT on-board calibration sources



**ABB Bomem Inc.**  
585 Charest Blvd. East, Suite 300  
Québec City, Quebec G1K 9H4 Canada  
Phone: 418-877-2944  
North America: 800-858-3847  
Fax: 418-877-2834  
E-mail: ftir@ca.abb.com