

# 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 instru**

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

## PIFTS Interferometer

ABB developed the interferometer for the PIFTS (Planetary Imaging Fourier Transform Spectrometer) for the University of Wisconsin. This is a small interferometer (5 x 5 x 3.5 inches, 1.5 kg) optimized for use in the IR wavelength range of 1-5.2  $\mu$ m. The beamsplitter is made of CaF<sub>2</sub>. The maximum optical path difference is +/- 4 mm, providing an unapodized resolution of 1.25  $\text{cm}^{-1}$ .

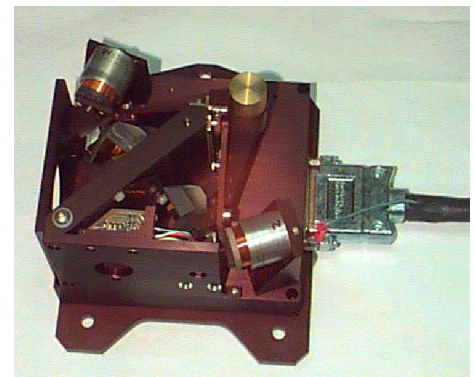
The unfolded optical layout is given in the bottom figure. The aperture diameter is 15 mm and is located at exit of the interferometer. It supports a full divergence of 108 mrad providing a total etendue of 0.016  $\text{cm}^2 \text{sr}$ .

The metrology is based on a DFB laser diode operating at 852 nm.

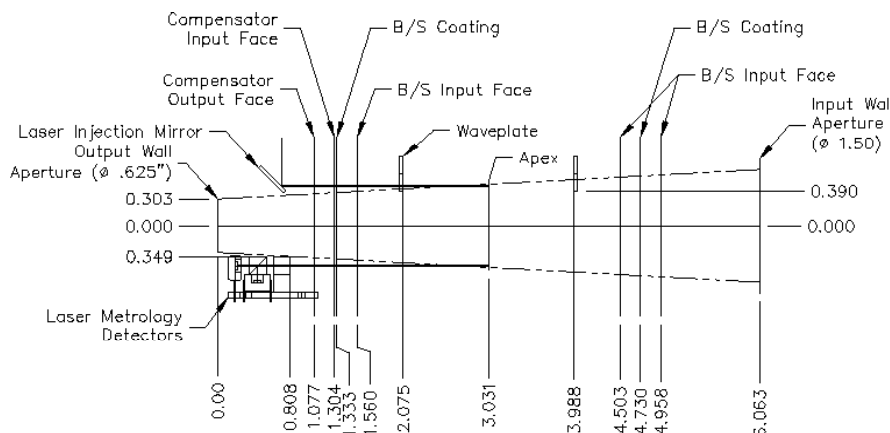
Another outstanding characteristics of the PIFTS Interferometer is its sweep speed that can be as low as 213  $\mu\text{m}/\text{sec}$  OPD (250 Hz fringe rate) to accommodate the slow frame rate of large number of pixels of imaging arrays.

The control electronics is located in a separate enclosure. It provides functionality such as variable OPD length and outputs the sampling window and sampling pulses.

This interferometer is also perfectly suited for applications where size and weight are very limited such as in UAVs and portable units.



*The PIFTS Interferometer*



**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