

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

ARIES System Description

The heart of the ARIES airborne spectrometer is a fast scanning Michelson interferometer covering the spectral range from $1.7 \mu\text{m}$ to $16.7 \mu\text{m}$ (600 cm^{-1} to 6000 cm^{-1}) providing state-of-the-art radiometric accuracy for thermal emission measurements. This technology offers better sensitivity and spectral purity than most other IR spectroscopic techniques.

Figure 1 shows the three components of the system, the optical head, the power supply assembly and the PC interface card.

A pressure enclosure (two-atmosphere overpressure) protects the optics and electronics against humidity and the high altitude environments. The optical head is temperature controlled to allow operation from -40C to 35C .

Detection is performed using an InSb/MCT sandwich detector mounted in a stirling cooler. Spectral resolution is better than 1 cm^{-1} in the long wave below 2000 cm^{-1} . The system collects 4 spectra per second (16 cm^{-1} resolution). The entrance window is ZnSe with 50 mm aperture. The instrument field-of-view is 45 mrad (approx. 3 degrees).

The output data is transmitted over fiber optics. The package comprises the acquisition electronics compatible with a PC computer. The acquisition card includes 16 Mbytes of dedicated RAM (expendable to 64 MB). Also included is all the software for operation of the instrument, calibration of the data and read-out of the various temperature measurements. An operator inside the aircraft controls the ARIES.



Figure 1 : ARIES Airborne Spectrometer



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