Eos
Cross-Calibration Radiometers

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Eos Radiometers

Philosophy

Spectral Coverage

Specific Design
Philosophy

Portable

Stable

Precise

Accurate
Spectral Coverage

0.4 - 1.0 μm  (Silicon QED)
0.8 - 1.65 μm  (Germanium)
1.5 - 2.5 μm  (cooled Indium Arsenide)
3.5 - 14.5 μm  (cooled Mercury Cadmium Telluride)
Silicon QED

Design Considerations

Fabrication

Data collection/storage

Concerns
Design considerations

Spectral
0.4 - ~1.0 μm
Silicon detectors (3 Hamamatsu S1337-1010BQN)
Interference Filter(s)

Radiometric
No optics (other than filter)
Precision apertures (2)
QED (5 detector surfaces)

Thermal
Temperature control
Detector / Amplifier
Apertures
Filter
Material
Invar
Stainless steel
Fabrication

Custom built

Precision tolerances
  detector alignment
  position
  angle
  aperture
  centering
  diameter
  circularity
  separation

Interchangeable detector blocks
Data collection/storage

Analog outputs
Detector voltage
Detector temperature
Filter temperature
"Instrument" temperature

Digital outputs
Filter id number

Analog/Digital conversion
Commercial data logger
17 bit A/D
0.03% accuracy (dcv / 1 year)
Rugged, compact (3 kg)
Commercial data acquisition hardware
17 bit A/D
0.01% accuracy (dcv / 1 year)
Rugged, transportable

Storage
Data logger (and/or)
Small MS-DOS computer (RAM card)
Amplifier

Design
Transimpedance configuration
low noise FET type OP AMP
temperature controlled
  op amp
  feedback resistor(s)
single or 1 per detector

Variable gain
  set by switch
  or
digital io from logger
Concerns

Operating Conditions (vacuum ?)

Radiance levels

Scheduling
Dimensions are inches