

# Eos Cross-Calibration Radiometers

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↳ TO

MODIS SCIENCE TEAM MTG

Attachment 3.4  
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NASA/GSFC

# Eos Radiometers

Philosophy

Spectral Coverage

Specific Design

Philosophy

Portable

Stable

Precise

Accurate

## Spectral Coverage

0.4 - 1.0  $\mu\text{m}$  (Silicon QED)

0.8 - 1.65  $\mu\text{m}$  (Germanium)

1.5 - 2.5  $\mu\text{m}$  (cooled Indium Arsenide)

3.5 - 14.5  $\mu\text{m}$  (cooled Mercury  
Cadmium Telluride)

# Silicon QED

Design Considerations

Fabrication

Data collection/storage

Concerns

## Design considerations

### Spectral

0.4 - ~1.0  $\mu\text{m}$

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

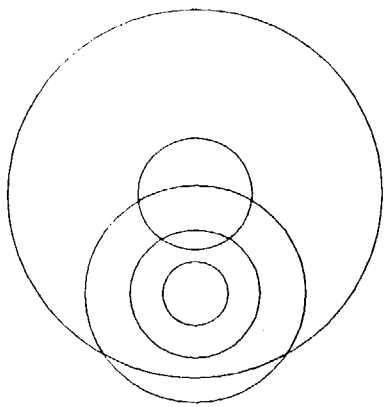
## Concerns

Operating Conditions (vacuum ?)

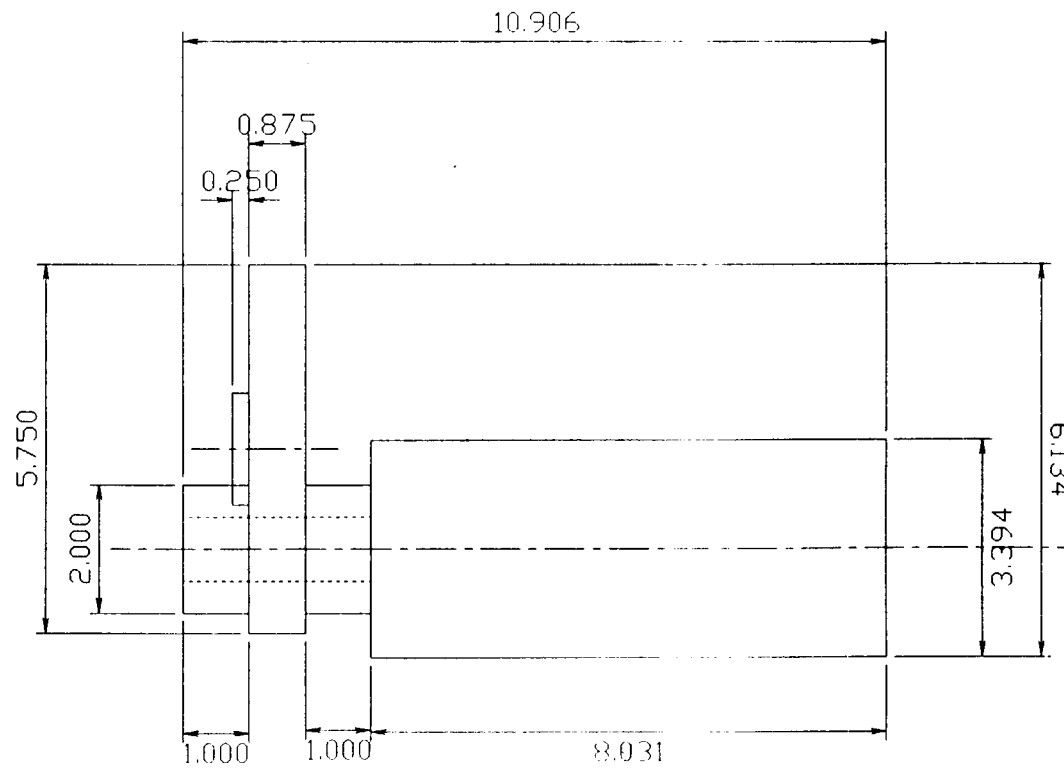
Radiance levels

Scheduling

Dimensions are inches



End on



Side