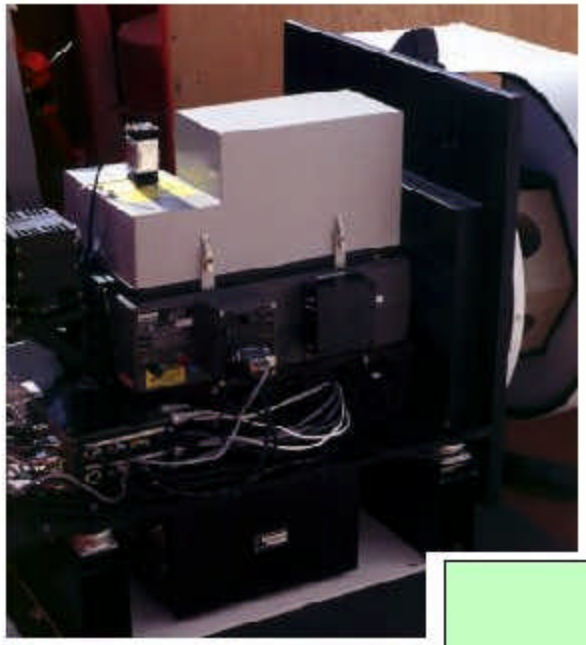
Marine-Atmosphere Emitted Radiance Interferometer



Specifications

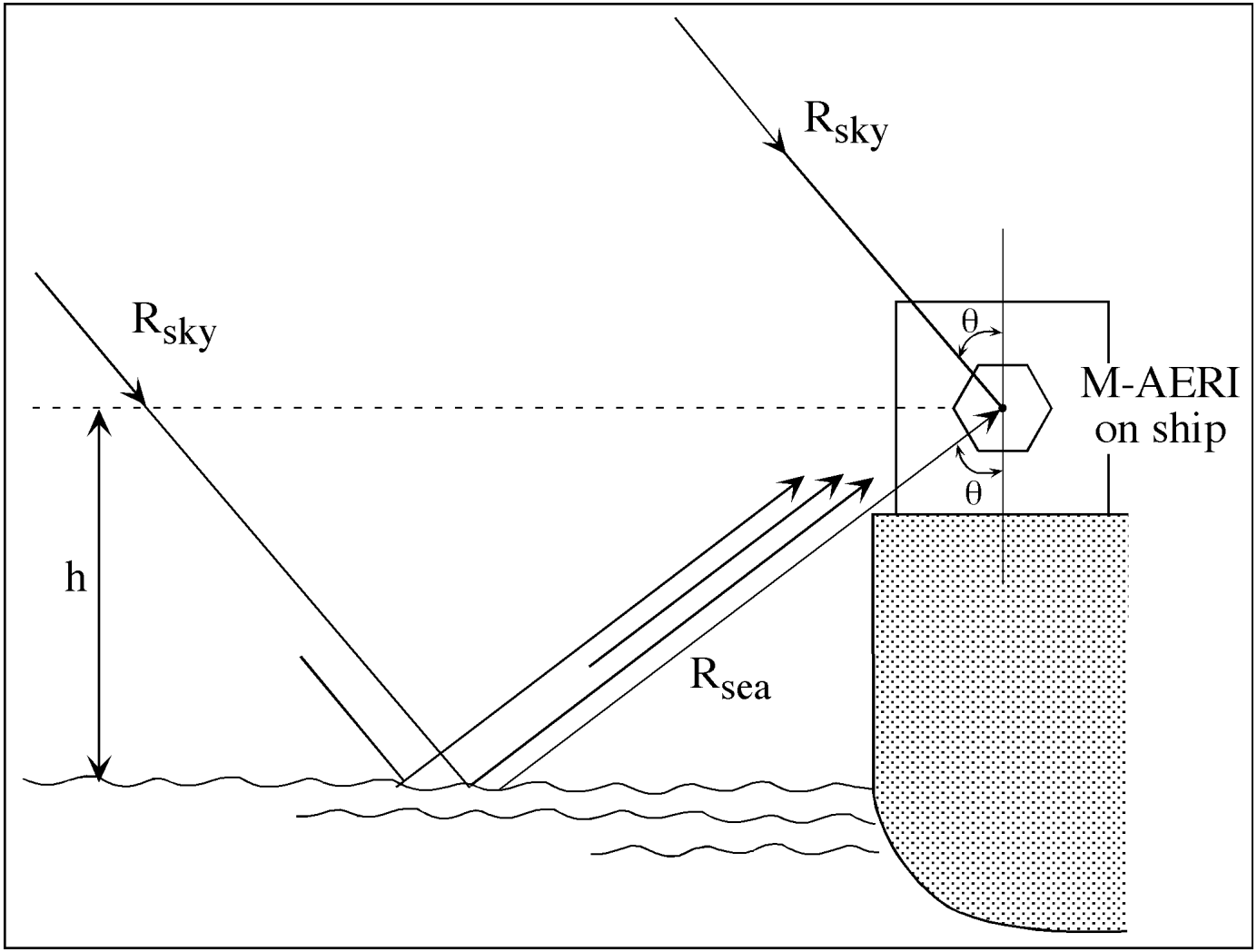
Spectral interval	~3 to ~18μm
Spectral resolution	0.5 cm^{-1}
Interferogram rate	1Hz
Aperture	2.5 cm
Detectors	InSb, HgCdTe
Detector temperature	78°K
Calibration	Two black-body cavities
SST retrieval uncertainty	<< 0.1K (absolute)

Laboratory tests of M-AERI accuracy

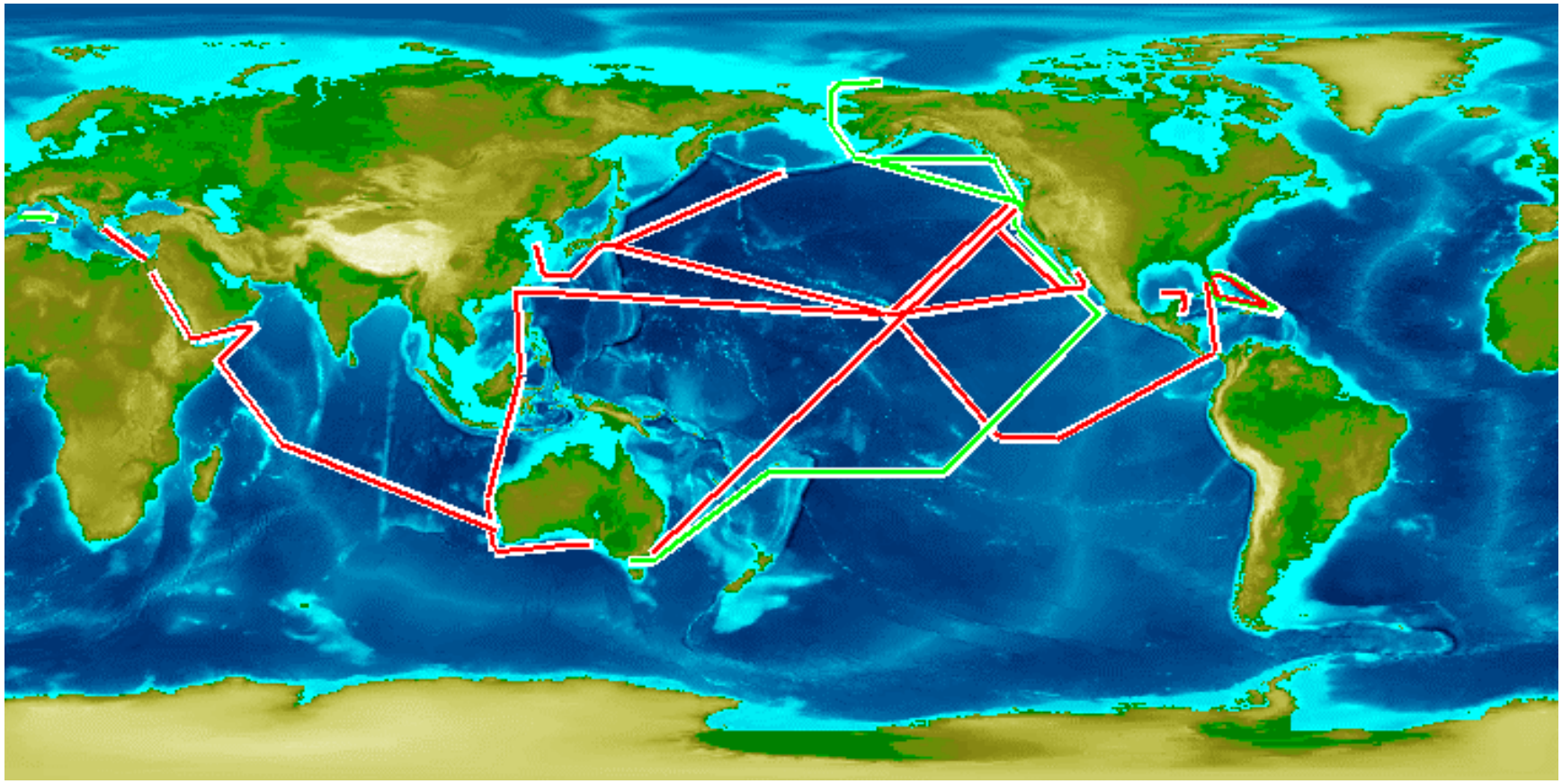
Target Temp.	LW (980-985 cm^{-1})	SW (2510-2515 cm^{-1})
20°C	+0.013 K	+0.010 K
30°C	-0.024 K	-0.030 K
60°C	-0.122 K	-0.086 K

The mean discrepancies in the M-AERI 02 measurements of the NIST water bath blackbody calibration target in two spectral intervals where the atmosphere absorption and emission are low. Discrepancies are M-AERI minus NIST temperatures.

Shipboard measurement of Skin SST by M-AERI



M-AERI Cruises since launch of *Terra* MODIS



In 2000 In 2001

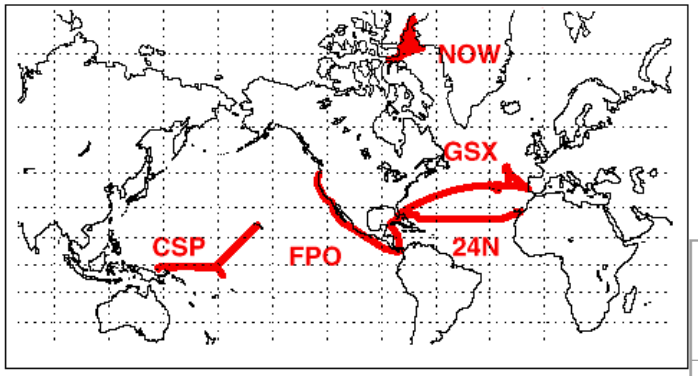
Time-series of M-AERI measurements on *Explorer of the Seas*

Year-round deployment for SST validation on a weekly schedule.

A cruise ship is equipped as an oceanographic and atmospheric research vessel. See www.rsmas.miami.edu/rccl

Photo – Kvaerner Masa Yards

AVHRR-MAERI SST validation experience



M-AERI validation of Pathfinder SSTs

Cruise Name	N	Mean K	St. Dev. K
CSP 1996	23	0.16	0.20
24N 1998	16	0.03	0.18
GASEX 1998	168	-0.01	0.25
FPO 1998	47	0.27	0.40
NOW 1998 (Arctic)	176	0.24	0.44
Total, all data	430	0.13	0.37
Total, excluding NOW data	254	0.06	0.29

Using skin temperatures reduces the uncertainties by about a factor of two.

See Kearns *et al*, 2000, ***Bull. Am. Met. Soc.***, **81**, 1525-1536