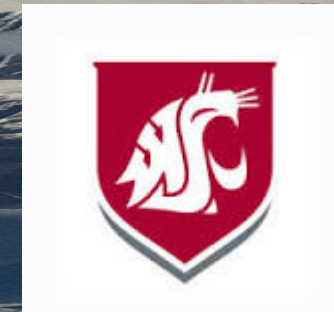


Contacts

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**Datagrams:
Summit
P-AERI**



Contacts

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 christopher.j.cox@noaa.gov
 Data Support: Sara Crepinsek
 sara.crepinsek@noaa.gov

Polar Atmospheric Emitted Radiance Interferometer

File name:

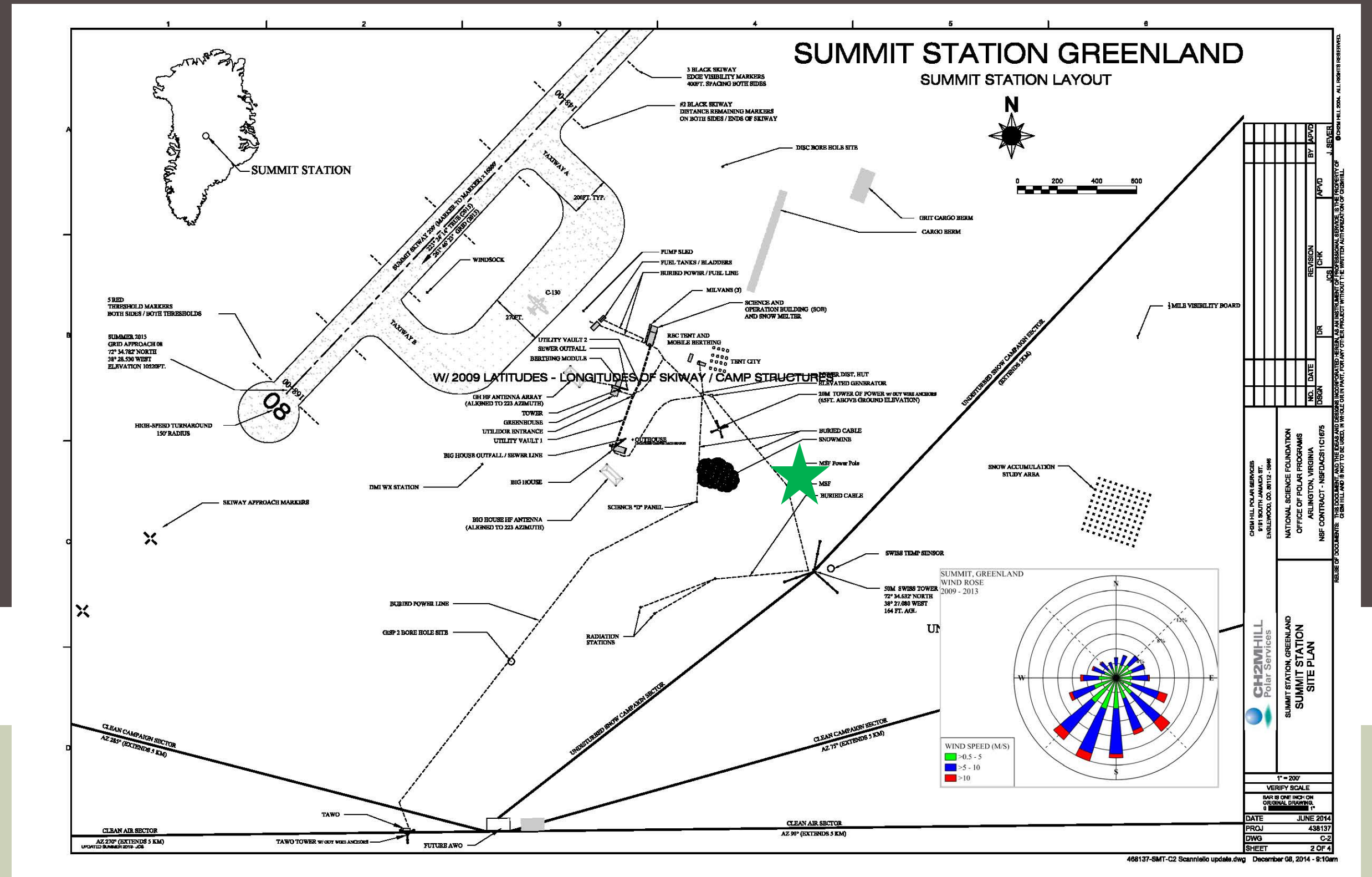
Calibrated and quality controlled radiances for channel 1 and channel 2 (Revercomb et al. 1988; Knuteson et al. 2004a,b) with additional routines (Rowe et al. 2011a,b).
 smtaerich1X1.b1.YYYYMMDD.HHMMSS.cdf
 smtaerich2X1.b1.YYYYMMDD.HHMMSS.cdf

Noise-filtered radiances (Antonelli et al., 2004; Turner et al. 2006)

smtaerich1nf1turnX1.c1.YYYYMMDD.HHMMSS.cdf
 smtaerich2nf1turnX1.c1.YYYYMMDD.HHMMSS.cdf

Housekeeping, etc.

smtaerisummaryX1.b1.YYYYMMDD.HHMMSS.cdf



★ Indicates current location of instrument

(yellow box with dark gray chimney)

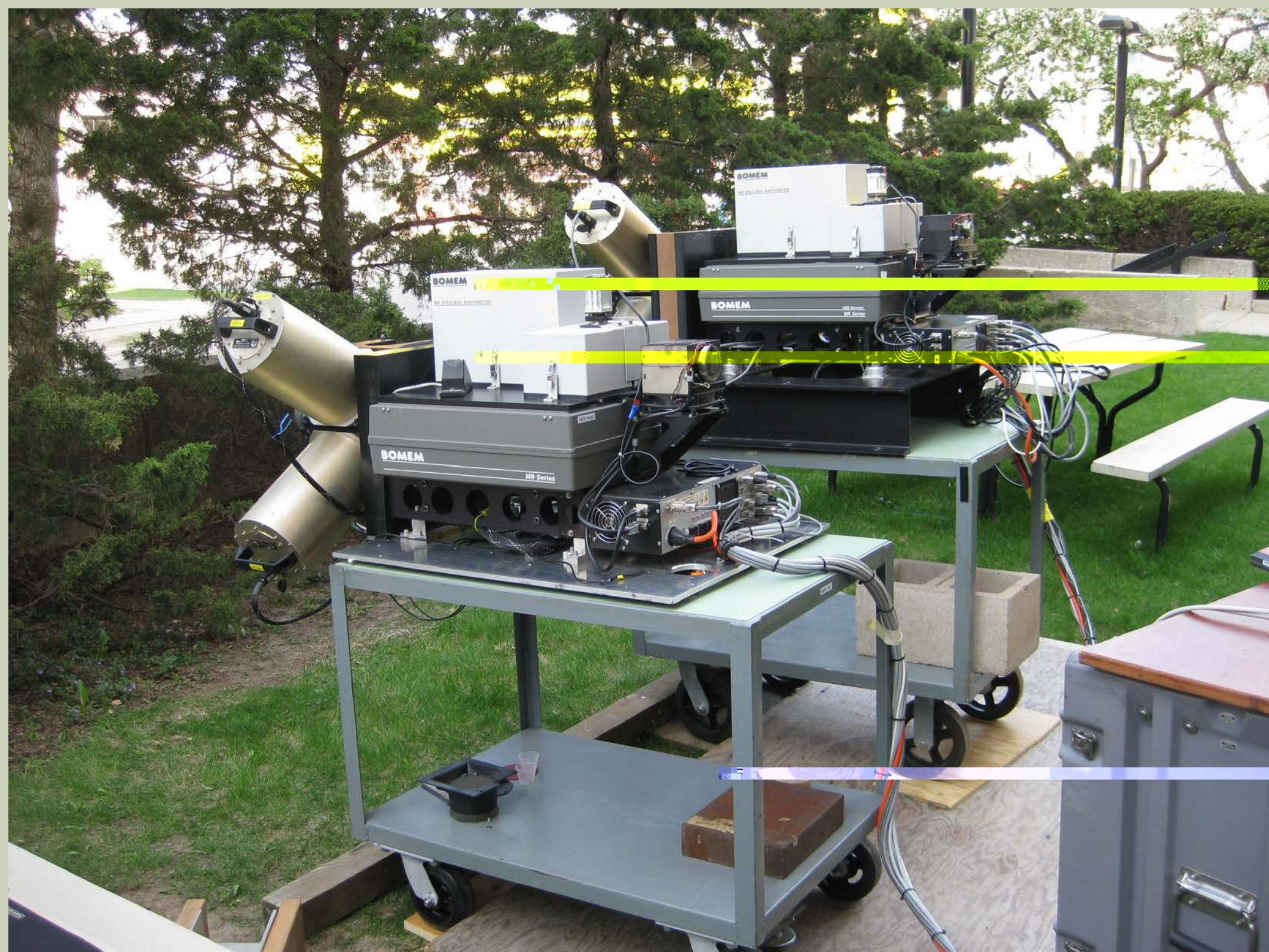
Summit Data Center

NOAA

FTP File locations at NOAA:
 From Summit Data Center to: then transferred to:
 ftp://ftp.etl.noaa.gov/psd3/arctic/summit/aeri/processed/

Quicklooks

Processing



Instrument Details

Specifications	
Measurement	Atmospheric Emitted Radiance Interferometer
Serial #	SZM433TL
Instrument Manufacturer	ABB/Bomem
Type	MR100
Location	Installed through wall of MSF and observes vertically through port

The instrument is self-calibrated by two on-board reference sources, one heated to a constant temperature and one ambient. Infrared spectral radiances ($\text{mW}[\text{m}^2 \text{sr cm}^{-1}]^{-1}$) are acquired with a spectral resolution of about 0.5 cm^{-1} from 490 cm^{-1} to 3000 cm^{-1} ($20.4 \mu\text{m}$ to $3.3 \mu\text{m}$). This spectral range is achieved using two sandwiched detectors, one mercury-cadmium-telluride (HgCdTe) ($490\text{-}1800 \text{ cm}^{-1}$) and one indiumantimonide (InSb) ($1800\text{-}3000 \text{ cm}^{-1}$), each maintained at 78 K using a Stirling cooler. The absolute accuracy is $< 1\%$ of ambient radiance with $< 0.2 \text{ mW}[\text{m}^2 \text{sr cm}^{-1}]^{-1}$ noise ($670\text{-}1400 \text{ cm}^{-1}$). The interferometer is manufactured by ABB/Bomem (MR100, serial #SZM433TL).

The P-AERI is operated in rapid-sample mode, alternating between views of the sky and each reference blackbody and acquiring a calibrated spectrum approximately every 30 s. Sky observations are at zenith ($\text{FOV} \sim 2.6^\circ$). The interferometer is housed inside the Mobile Science Facility with the foreoptics protruding through a hole in the wall into a hatch through which the instrument views the sky between about 1 and 3 m above the surface, depending on the level of drifting snow. The hatch can be closed during precipitation events to protect the optics, but at Summit this practice was discontinued in January 2011 because it was determined that the instrumental setup at Summit does not expose the optics to snow. Standard quality control procedures are applied during processing. These procedures screen for low responsivity (an indicator of frost on the optics), temperature stability of the reference blackbodies, and spectra exhibiting noise outside the acceptable range.

Antonelli, P. and Coauthors (2004), A principal component noise filter for high spectral resolution infrared measurements, *J. Geophys. Res.*, 109, D23102, doi:10.1029/2004JD004862.

Knuteson, R.O. and Coauthors (2004), Atmospheric Emitted Radiance Interferometer. Part I: Instrument Design, *J. Atmos. Oceanic Technol.*, 21, 1763–1776. doi: 10.1175/JTECH-1662.1.

Knuteson, R.O. and Coauthors (2004), Atmospheric Emitted Radiance Interferometer. Part II: Instrument Performance, *J. Atmos. Oceanic Technol.*, 21, 1777–1789. doi: 10.1175/JTECH-1663.1.

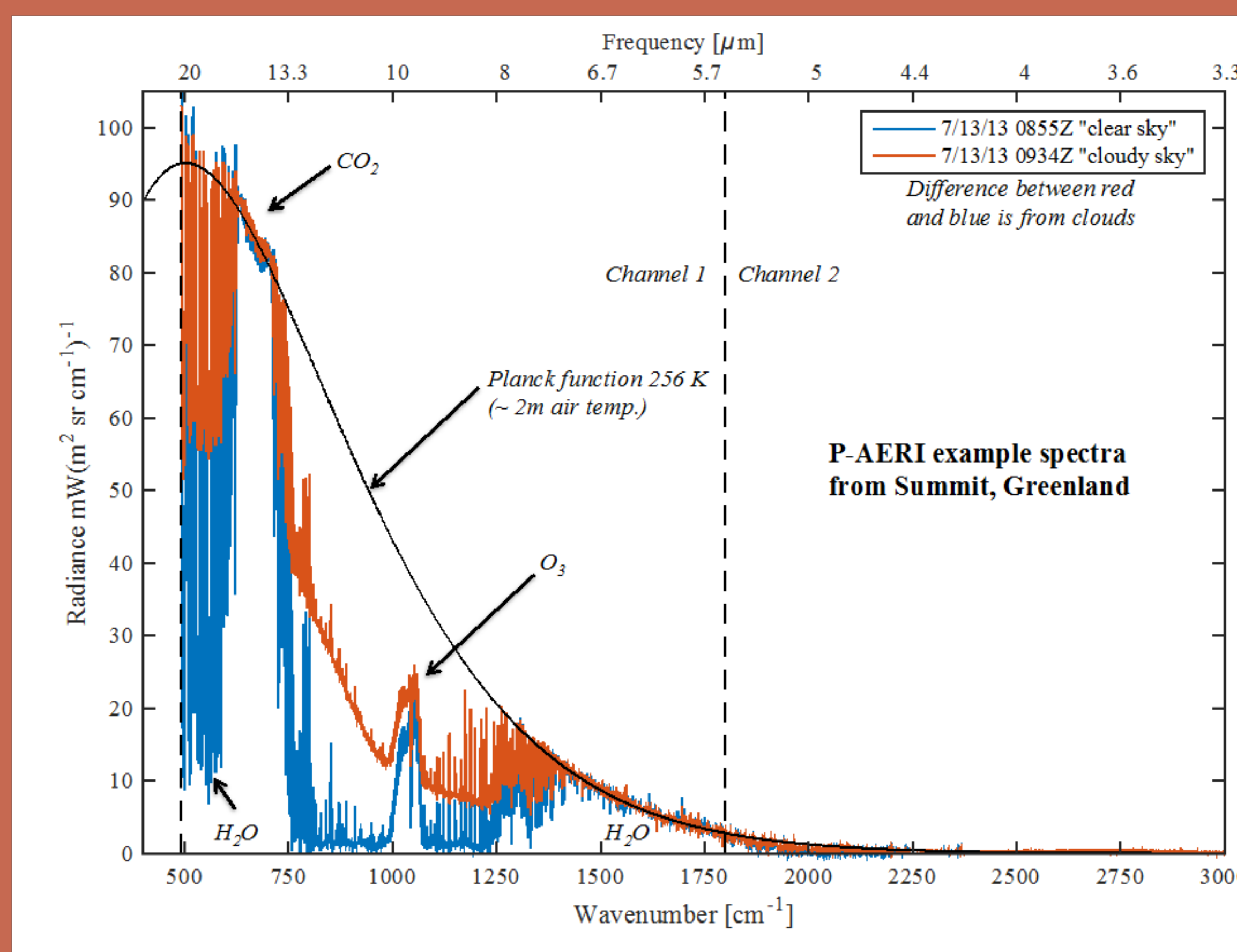
Rowe, P. M., S.P. Neshyba, and V.P. Walden (2011a), Responsivity-based criterion for accurate calibration of FTIR emission spectra: Theoretical development and bandwidth estimation, *Opt. Express*, 19, 5451–5463. doi: 10.1364/OE.19.005451.

Rowe, P. M., S. P. Neshyba, C. J. Cox, and V. P. Walden (2011b), Responsivity-based criterion for accurate calibration of FTIR emission spectra: Identification of in-band low-responsivity wavenumbers, *Opt. Express*, 19, 5930–5941. doi: 10.1364/OE.19.005930.

Turner, D.D., R.O. Knuteson, H.E. Revercomb, C. Lo, and R.G. Dedecker (2006), Noise Reduction of Atmospheric Emitted Radiance Interferometer (AERI) Observations Using Principal Component Analysis, *J. Atmos. Oceanic Technol.*, 23, 1223–1238. doi: 10.1175/JTECH1906.1

Revercomb, H.E., H. Buijs, H.B. Howell, D.D. LaPorte, W.L. Smith, and L.A. Sromovsky (1988), Radiometric calibration of IR Fourier transform spectrometers: Solution to a problem with the High-Resolution Interferometer Sounder, *Appl. Opt.*, 27, 3210 – 3218.

Example Plots:



Home:

<http://www.esrl.noaa.gov/psd/iasoa/>

Data:

<http://www.esrl.noaa.gov/psd/iasoa/dataatagance>

[IASOA Portal](#)

Home:

www.archive.arm.gov

[ARM Archive](#)

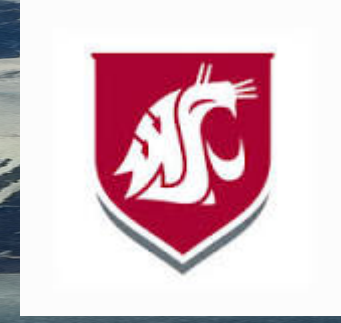
[Product](#)

Product File:

File Names	File Location NOAA ftp
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smtaerich1X1.b1.YYYYMMDD.hhmmss.cdf	ftp://ftp.etl.noaa.gov/psd3/arctic/summit/aeri/processed/
smtaerich2nf1turnX1.c1.YYYYMMDD.hhmmss.cdf	ftp://ftp.etl.noaa.gov/psd3/arctic/summit/aeri/processed/
smtaerich2X1.b1.YYYYMMDD.hhmmss.cdf	ftp://ftp.etl.noaa.gov/psd3/arctic/summit/aeri/processed/
smtaerisummaryX1.b1.YYYYMMDD.hhmmss.cdf	ftp://ftp.etl.noaa.gov/psd3/arctic/summit/aeri/processed/
Archived files located at ARM.gov	http://www.archive.arm.gov/armlogin/login.jsp

Contacts

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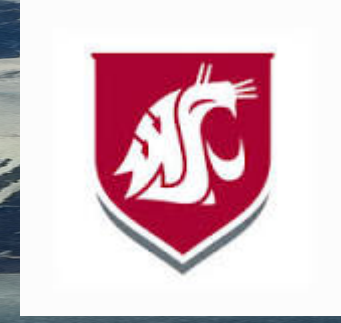
Polar Atmospheric Emitted Radiance Interferometer

Product netCDF Metadata

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Attributes			
Name	Value		
Comments	'tmp.dat'		
'experiment'	'Integrated Characterization of Energy, Clouds, Atmospheric State, and Precipitation at Summit (ICECAPS), Pls are Ralf Bennartz, Matthew Shupe, David Turner and Von P. Walden'		
'contact'	'Von P. Walden (v.walden@wsu.edu)'		
'reference_project'	'Shupe et al. (2013), Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-11-00249.1.'		
'date_created'	'19-Dec-2014'		
'missing_data_flag'	'-9999'		
'site_id'	'smt'		
'facility_id'	'X1: Summit, Greenland'		
'FOVhalfAngle'	'0.0230 radians'		
'FOVhalfAngle_description'	'Field of view half angle used in finite FOV correction'		
'description'	'This dataset contains calibrated and quality-controlled Atmospheric Emitted Radiance Interferometer (AERI) infrared spectral radiances [mW(m ² sr cm ⁻¹) ⁻¹]. Environment and instrument related metadata are also included.'		
'originalLaserWavenumber'	'15799.05'		
'originalLaserWavenumber_description'	'Original laser wavenumber assumed for this instrument'		
'outputLaserWavenumber'	'15799.00'		
'outputLaserWavenumber_description'	'Laser wavenumber used in definition of output wavenumber scale'		
'originalInterferogramSize'	'8192.0'		
'originalInterferogramSize_description'	'Size of buffer holding initial spectrum'		
'expandedInterferogramSize'	'131072.0'		
'expandedInterferogramSize_description'	'Size of buffer holding expanded spectrum before interpolation'		
Dimensions			
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'wnum'	2714		
'hatch_dim'	3352		
'scalar'	1		
'time1'	3352		
'wavenumber1'	2714		
Variables			
Name	Long name		Units
'date'	None		None
'base_time'	Base time in Epoch		seconds
'wnum'	Wave number in reciprocal centimeters		cm ⁻¹
'time_offset'	Time offset from base_time		seconds since 2014-03-11 00:03:30 GMT
'missingDataFlag'	Logical flag indicating that a data record is missing (true/false)		count
'sceneMirPosEncoderMaxDrift'	Maximum departure from ideal of the mirror position over the course of all contributing views. Typically two hot		count
'BBcavityFactor'	Blackbody cavity geometry factor		count
'HBBtempOffset'	Corrective offset for final hot blackbody average temperature		degrees_Kelvin
'ABBtempOffset'	Corrective offset for final ambient blackbody average temperature		degrees_Kelvin
'HBBbottomTempWeight'	Weight factor for bottom used in calculating hot blackbody temperature average		%/100
'HBBapexTempWeight'	Weight factor for apex used in calculating hot blackbody temperature average		%/100
'HBBtopTempWeight'	Weight factor for top used in calculating hot blackbody temperature average		%/100
'ABBbottomTempWeight'	Weight factor for bottom used in calculating ambient blackbody temperature average		%/100
'ABBapexTempWeight'	Weight factor for apex used in calculating ambient blackbody temperature average		%/100
'ABBtopTempWeight'	Weight factor for top used in calculating ambient blackbody temperature average		%/100
'calibratedSceneID'	Type of scene that has been calibrated (ASCII character as float)		count
'calibrationHBBtemp'	Hot blackbody temperature used in calibration		degrees_Kelvin
'calibrationCBBtemp'	Cold blackbody temperature used in calibration		degrees_Kelvin
'calibrationAmbientTemp'	Ambient temperature used in calibration		degrees_Kelvin
'channelNumber'	Instrument data channel number		count
'sceneMirPosEncoderDrift'	Difference between actual and ideal motor encoder values for current view; indicative of quality of the mirror positioning.		count
'HBBmaxTempDiff'	Maximum Temperature Difference Between HBB Thermistors		degrees_Kelvin
'ABBmaxTempDiff'	Maximum Temperature Difference Between ABB Thermistors		degrees_Kelvin
'maxRoll'	Maximum roll of the interferometer during scan. Roll axis is coincident with the axis of mirror rotation. Zero value indicates level.		degrees
'maxPitch'	Maximum pitch of the interferometer during scan. Pitch axis is perpendicular to the axis of mirror rotation. Zero value indicates level.		degrees
'opticsCompartmentRelativeHumidity'	Relative humidity measured in the optics compartment atop the interferometer.		%
'sceneMirrorMotorStep'	Motor step value given to motor controller to achieve proper mirror positioning		count
'sceneMirrorAngle'	Scene mirror view angle in non-negative degrees		degrees
'maxSampleStdDev'	Maximum Standard Deviation in Thermistor Channels 0..7		degrees_Kelvin
'atmosphericPressure'	Observation atmospheric pressure in AERI electronics		millibars
'interferometerEnclosureRelativeHumidity'	Relative Humidity measured in the Interferometer Enclosure		%
'atmosphericRelativeHumidity'	Relative humidity measured near Blackbodies. Use with Air Temperature Near BBs only.		%
'interferometerWindowTemp'	Interferometer window temperature measured on the outside of the aluminum window flange		degrees_Kelvin
'rainSensorIntensity'	Rain sensor analog output: the rain sensor is located inside the hatch near the sky aperture and is used to flag the critical condition of rain falling on the AERI sky aperture. If rain is detected		millimeters/hour
'detectorTemp'	Detector temperature sensed via diode near detector		degrees_Kelvin
'coolerCurrent'	Stirling cycle cooler current		amperes
'SCEtemp'	Signal conditioning electronics inside air temperature		degrees_Kelvin
'motorDriverTemp'	Scene mirror motor driver heat sink temperature		degrees_Kelvin
'computerTemp'	AERI ingest computer temperature measured at back panel of computer		degrees_Kelvin
'rackAmbientTemp'	Electronics rack ambient temperature measured at inside top of rack		degrees_Kelvin
'coolerPowerSupplyTemp'	Stirling cooler power supply temperature measured at power supply frame		degrees_Kelvin
'coolerExpanderTemp'	Stirling cycle cooler expander temperature		degrees_Kelvin
'coolerCompressorTemp'	Stirling cooler compressor temperature measured at compressor heatsink		degrees_Kelvin
'BBcontroller2temp'	Blackbody controller Unit 2 power supply temperature		degrees_Kelvin
'BBcontroller1temp'	Blackbody controller Unit 1 power supply temperature		degrees_Kelvin
'fixed12KohmResistor'	Resistive temperature of 12 Kohm fixed resistor located in SCE-P3 shell		degrees_Kelvin
'mirrorMotorTemp'	Scene mirror motor case temperature		degrees_Kelvin
'airNearBBsTemp'	Ambient air temperature near blackbodies		degrees_Kelvin
'BBSupportStructureTemp'	Temperature of the AERI blackbody support structure		degrees_Kelvin
'interferometerSecondPortTemp'	AERI interferometer temperature at second port		degrees_Kelvin
'airNearInterferometerTemp'	Ambient air temperature near the interferometer		degrees_Kelvin
'outsideAirTemp'	Ambient air temperature at hatch opening		degrees_Kelvin
'fixed97KohmResistor'	Resistive temperature of 97 Kohm fixed resistor located in SCE-P4 shell		degrees_Kelvin
'fixed2500ohmResistor'	Resistive temperature of 2500 Ohm fixed resistor - banana plug mounted		degrees_Kelvin
'HBBbottomTemp'	Hot blackbody temperature - rim bottom		degrees_Kelvin
'HBBapexTemp'	Hot blackbody temperature - apex		degrees_Kelvin
'HBBtopTemp'	Hot blackbody temperature - rim top		degrees_Kelvin
'ABBbottomTemp'	Ambient blackbody temperature		degrees_Kelvin
'ABBapexTemp'	Ambient blackbody temperature - apex		degrees_Kelvin
'ABBtopTemp'	Ambient blackbody temperature - rim top		degrees_Kelvin
'JulianDay'	Julian Day including day and fraction of day		days
'sceneMirPosEncoder'	Scene mirror position encoder value		count
'sceneMirPosCount'	Number of views in a sequence		count
'sceneMirrorPosition'	Instrument scene mirror position identifier		count
'coadditionsCount'	Number of complete (forward+backward) interferogram scans in sample average		count
'sceneViewDuration'	Duration of scene view		seconds
'systemReleaseNumber'	Version number of Operational Software		count
'Altitude'	Observation Altitude		feet
'Longitude'	Observation longitude		degrees_east
'Latitude'	Observation latitude		degrees_north
'timeHHMMSS'	Time at center of AERI sky observation period		hour.minute.second
'dateYYMMDD'	Observation date		year.month.day
'instrumentUnitNumber'	Character string containing instrument name		count
'AERIunitNumber'	AERI instrument unit serial number		count
'Time'	Time at center of AERI sky observation period		hours
'mean_rad'	Interferometer scan directional average of radiance		mw/(m ² sr cm ⁻¹)
'hatchOpen'	hatch open flag. 1 = open		unitless
'time'	Time offset from midnight		seconds since 2014-03-11 00:00:00 0:00 GMT
'qc_time'	Dummy variable for compatibility with ARM AERI files		unitless
'Time_UTC_hours'	Time at center of AERI sky observation period		hours since 2014-03-11 00:00:00 0:00 GMT
'lat'	north latitude		degrees
'lon'	east longitude		degrees
'alt'	altitude		meters above Mean Sea Level

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Summit
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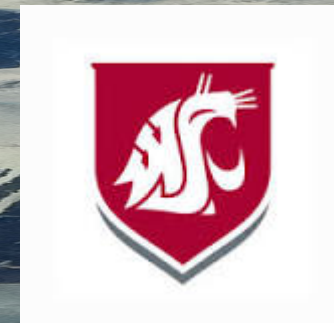
Polar Atmospheric Emitted Radiance Interferometer

Product netCDF Metadata

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'contact'	'Von P. Walden (v.walden@wsu.edu)'		
'reference_project'	Shupe et al. (2013), Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-11-00249.1.'		
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'facility_id'	X1: Summit Greenland'		
'FOVhalfAngle'	'0.0230 radians'		
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'originalInterferogramSize_description'	'Size of buffer holding initial spectrum'		
'expandedInterferogramSize'	'131072.0'		
'expandedInterferogramSize_description'	'Size of buffer holding expanded spectrum before interpolation'		
Dimensions			
Name	Length		
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'wnum'	2531		
'hatch_dim'	3352		
'scalar'	1		
'time2'	3352		
'wavenumber2'	2531		
Variables			
Name	Long name	Units	
'date'	None	None	
'base_time'	Base time in Epoch	seconds	
'wnum'	Wave number in reciprocal centimeters	cm^-1	
'time_offset'	Time offset from base_time	seconds since 2014-09-09 00:03:22 GMT	
'missingDataFlag'	Logical flag indicating that a data record is missing (true/false)	count	
'sceneMirPosEncoderMaxDrift'	Maximum departure from ideal of the mirror position over the course of all contributing views. Typically two hot	count	
'BBcavityFactor'	Blackbody cavity geometry factor	count	
'HBBtempOffset'	Corrective offset for final hot blackbody average temperature	degrees_Kelvin	
'ABBtempOffset'	Corrective offset for final ambient blackbody average temperature	degrees_Kelvin	
'HBBbottomTempWeight'	Weight factor for bottom used in calculating hot blackbody temperature average	%/100	
'HBBapexTempWeight'	Weight factor for apex used in calculating hot blackbody temperature average	%/100	
'HBBtopTempWeight'	Weight factor for top used in calculating hot blackbody temperature average	%/100	
'ABBbottomTempWeight'	Weight factor for bottom used in calculating ambient blackbody temperature average	%/100	
'ABBapexTempWeight'	Weight factor for apex used in calculating ambient blackbody temperature average	%/100	
'ABBtopTempWeight'	Weight factor for top used in calculating ambient blackbody temperature average	%/100	
'calibratedSceneID'	Type of scene that has been calibrated (ASCII character as float)	count	
'calibrationHBBtemp'	Hot blackbody temperature used in calibration	degrees_Kelvin	
'calibrationCBBtemp'	Cold blackbody temperature used in calibration	degrees_Kelvin	
'calibrationAmbientTemp'	Ambient temperature used in calibration	degrees_Kelvin	
'channelNumber'	Instrument data channel number	count	
'sceneMirPosEncoderDrift'	Difference between actual and ideal motor encoder values for current view; indicative of quality of the mirror positioning.	count	
'HBBmaxTempDiff'	Maximum Temperature Difference Between HBB Thermistors	degrees_Kelvin	
'ABBmaxTempDiff'	Maximum Temperature Difference Between ABB Thermistors	degrees_Kelvin	
'maxRoll'	Maximum roll of the interferometer during scan. Roll axis is coincident with the axis of mirror rotation. Zero value indicates level.	degrees	
'maxPitch'	Maximum pitch of the interferometer during scan. Pitch axis is perpendicular to the axis of mirror rotation. Zero value indicates level.	degrees	
'opticsCompartmentRelativeHumidity'	Relative humidity measured in the optics compartment atop the interferometer.	%	
'sceneMirrorMotorStep'	Motor step value given to motor controller to achieve proper mirror positioning	count	
'sceneMirrorAngle'	Scene mirror view angle in non-negative degrees	degrees	
'maxSampleStdDev'	Maximum Standard Deviation in Thermistor Channels 0..7	degrees_Kelvin	
'atmosphericPressure'	Observation atmospheric pressure in AERI electronics	millibars	
'interferometerEnclosureRelativeHumidity'	Relative Humidity measured in the Interferometer Enclosure	%	
'atmosphericRelativeHumidity'	Relative humidity measured near Blackbodies. Use with Air Temperature Near BBs only.	%	
'interferometerWindowTemp'	Interferometer window temperature measured on the outside of the aluminum window flange	degrees_Kelvin	
'rainSensorIntensity'	Rain sensor analog output: the rain sensor is located inside the hatch near the sky aperture and is used to flag the critical condition of rain falling on the AERI sky aperture. If rain is detected	millimeters/hour	
'detectorTemp'	Detector temperature sensed via diode near detector	degrees_Kelvin	
'coolerCurrent'	Stirling cycle cooler current	amperes	
'SCEtemp'	Signal conditioning electronics inside air temperature	degrees_Kelvin	
'motorDriverTemp'	Scene mirror motor driver heat sink temperature	degrees_Kelvin	
'computerTemp'	AERI ingest computer temperature measured at back panel of computer	degrees_Kelvin	
'rackAmbientTemp'	Electronics rack ambient temperature measured at inside top of rack	degrees_Kelvin	
'coolerPowerSupplyTemp'	Stirling cooler power supply temperature measured at power supply frame	degrees_Kelvin	
'coolerExpanderTemp'	Stirling cycle cooler expander temperature	degrees_Kelvin	
'coolerCompressorTemp'	Stirling cooler compressor temperature measured at compressor heatsink	degrees_Kelvin	
'BBcontroller2temp'	Blackbody controller Unit 2 power supply temperature	degrees_Kelvin	
'BBcontroller1temp'	Blackbody controller Unit 1 power supply temperature	degrees_Kelvin	
'fixed12KohmResistor'	Resistive temperature of 12 Kohm fixed resistor located in SCE-P3 shell	degrees_Kelvin	
'mirrorMotorTemp'	Scene mirror motor case temperature	degrees_Kelvin	
'airNearBBsTemp'	Ambient air temperature near blackbodies	degrees_Kelvin	
'BBsupportStructureTemp'	Temperature of the AERI blackbody support structure	degrees_Kelvin	
'interferometerSecondPortTemp'	AERI interferometer temperature at second port	degrees_Kelvin	
'airNearInterferometerTemp'	Ambient air temperature near the interferometer	degrees_Kelvin	
'outsideAirTemp'	Ambient air temperature at hatch opening	degrees_Kelvin	
'fixed97KohmResistor'	Resistive temperature of 97 Kohm fixed resistor located in SCE-P4 shell	degrees_Kelvin	
'fixed2500ohmResistor'	Resistive temperature of 2500 Ohm fixed resistor - banana plug mounted	degrees_Kelvin	
'HBBbottomTemp'	Hot blackbody temperature - rim bottom	degrees_Kelvin	
'HBBapexTemp'	Hot blackbody temperature - apex	degrees_Kelvin	
'HBBtopTemp'	Hot blackbody temperature - rim top	degrees_Kelvin	
'ABBbottomTemp'	Ambient blackbody temperature	degrees_Kelvin	
'ABBapexTemp'	Ambient blackbody temperature - apex	degrees_Kelvin	
'ABBtopTemp'	Ambient blackbody temperature - rim top	degrees_Kelvin	
'JulianDay'	Julian Day including day and fraction of day	days	
'sceneMirPosEncoder'	Scene mirror position encoder value	count	
'sceneMirPosCount'	Number of views in a sequence	count	
'sceneMirrorPosition'	Instrument scene mirror position identifier	count	
'coadditionsCount'	Number of complete (forward+backward) interferogram scans in sample average	count	
'sceneViewDuration'	Duration of scene view	seconds	
'systemReleaseNumber'	Version number of Operational Software	count	
'Altitude'	Observation Altitude	feet	
'Longitude'	Observation longitude	degrees_east	
'Latitude'	Observation latitude	degrees_north	
'timeHHMMSS'	Time at center of AERI sky observation period	hour.minute.second	
'dateYMMDD'	Observation date	year.month.day	
'instrumentUnitNumber'	Character string containing instrument name	count	
'AERILunitNumber'	AERI instrument unit serial number	count	
'Time'	Time at center of AERI sky observation period	hours	
'mean_rad'	Interferometer scan directional average of radiance	mw/(m2 sr cm-1)	
'hatchOpen'	hatch open flag. 1 = open	unitless	
'time'	Time offset from midnight	seconds since 2014-09-09 00:00:00 0:00 GMT	
'qc_time'	Dummy variable for compatibility with ARM AERI files	unitless	
'Time_UTC_hours'	Time at center of AERI sky observation period	hours since 2014-09-09 00:00:00 0:00 GMT	
'lat'	north latitude	degrees	
'lon'	east longitude	degrees	
'alt'	altitude	meters above Mean Sea Level	

Contacts

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 Research Contact: Von P. Walden
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 Research Scientist: Penny M. Rowe
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Datagrams:
Summit
P-AERI



Contacts

Research Contact: Christopher Cox
 christopher.j.cox@noaa.gov
 Data Support: Sara Crepinsek
 sara.crepinsek@noaa.gov

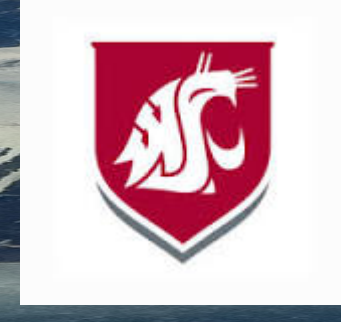
Polar Atmospheric Emitted Radiance Interferometer

Product netCDF Metadata

File name: smtaerich1nf1turnX1.c1.20140623.000315.cdf		Path: summit\AERI\processed
Attributes		
Name	Value	
'Comments'	'tmp.dat'	
'experiment'	Integrated Characterization of Energy, Clouds, Atmospheric State, and Precipitation at Summit (ICECAPS), Pls are Ralf Bennartz, Matthew Shupe, David Turner and Von P. Walden	
'contact'	Von P. Walden (v.walden@wsu.edu)	
'reference_project'	Shupe et al. (2013), Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-11-00249.1.	
'date_created'	'21-Dec-2014'	
'missing_data_flag'	'-9999'	
'site_id'	'smt'	
'facility_id'	X1: Summit, Greenland'	
'FOVhalfAngle'	'0.0230 radians'	
'FOVhalfAngle_description'	'Field of view half angle used in finite FOV correction'	
'description'	This dataset contains calibrated and quality-controlled Atmospheric Emitted Radiance Interferometer (AERI) infrared spectral radiances [mW(m ² sr cm ⁻¹) ⁻¹]. These spectra have also been noise-filtered using a Principal Components (PC) technique. See the reference_datastream global attribute for references. Environment and instrument related metadata are also included.	
'originalLaserWavenumber'	'15799.05'	
'originalLaserWavenumber_description'	'Original laser wavenumber assumed for this instrument'	
'outputLaserWavenumber'	'15799.00'	
'outputLaserWavenumber_description'	'Laser wavenumber used in definition of output wavenumber scale'	
'originalInterferogramSize'	'8192.0'	
'originalInterferogramSize_description'	'Size of buffer holding initial spectrum'	
'expandedInterferogramSize'	'131072.0'	
'expandedInterferogramSize_description'	'Size of buffer holding expanded spectrum before interpolation'	
'reference_datastream'	Antonelli et al. (2004) J. Geophys. Res.109, D23102.doi:10.1029/2004JD00482 -and- Turner et al. (2006) J. Atmos. Ocean. Tech.23: 1223-1238 doi:10.1175/JTECH1906.1.'	
Dimensions		
Name	Length	
'time'	3344	
'wnum'	2714	
'hatch_dim'	3344	
'scalar'	1	
'time1'	3344	
'wavenumber1'	2714	
Variables		
Name	Long name	Units
'date'	None	None
'base_time'	Base time in Epoch	seconds
'wnum'	Wave number in reciprocal centimeters	cm ⁻¹
'time_offset'	Time offset from base_time	seconds since 2014-06-23 00:03:15 GMT
'missingDataFlag'	Logical flag indicating that a data record is missing (true/false)	count
'sceneMirPosEncoderMaxDrift'	Maximum departure from ideal of the mirror position over the course of all contributing views. Typically two hot	count
'BBcavityFactor'	Blackbody cavity geometry factor	count
'HBBtempOffset'	Corrective offset for final hot blackbody average temperature	degrees_Kelvin
'ABBtempOffset'	Corrective offset for final ambient blackbody average temperature	degrees_Kelvin
'HBBbottomTempWeight'	Weight factor for bottom used in calculating hot blackbody temperature average	%/100
'HBBapexTempWeight'	Weight factor for apex used in calculating hot blackbody temperature average	%/100
'HBBtopTempWeight'	Weight factor for top used in calculating hot blackbody temperature average	%/100
'ABBbottomTempWeight'	Weight factor for bottom used in calculating ambient blackbody temperature average	%/100
'ABBapexTempWeight'	Weight factor for apex used in calculating ambient blackbody temperature average	%/100
'ABBtopTempWeight'	Weight factor for top used in calculating ambient blackbody temperature average	%/100
'calibratedSceneID'	Type of scene that has been calibrated (ASCII character as float)	
'calibrationHBBtemp'	Hot blackbody temperature used in calibration	degrees_Kelvin
'calibrationCBBtemp'	Cold blackbody temperature used in calibration	degrees_Kelvin
'calibrationAmbientTemp'	Ambient temperature used in calibration	degrees_Kelvin
'channelNumber'	Instrument data channel number	count
'sceneMirPosEncoderDrift'	Difference between actual and ideal motor encoder values for current view; indicative of quality of the mirror positioning.	count
'HBBmaxTempDiff'	Maximum Temperature Difference Between HBB Thermistors	degrees_Kelvin
'ABBmaxTempDiff'	Maximum Temperature Difference Between ABB Thermistors	degrees_Kelvin
'maxRoll'	Maximum roll of the interferometer during scan. Roll axis is coincident with the axis of mirror rotation. Zero value indicates level.	degrees
'maxPitch'	Maximum pitch of the interferometer during scan. Pitch axis is perpendicular to the axis of mirror rotation. Zero value indicates level.	degrees
'opticsCompartmentRelativeHumidity'	Relative humidity measured in the optics compartment atop the interferometer.	%
'sceneMirrorMotorStep'	Motor step value given to motor controller to achieve proper mirror positioning	count
'sceneMirrorAngle'	Scene mirror view angle in non-negative degrees	degrees
'maxSampleStdDev'	Maximum Standard Deviation in Thermistor Channels 0..7	degrees_Kelvin
'atmosphericPressure'	Observation atmospheric pressure in AERI electronics	millibars
'interferometerEnclosureRelativeHumidity'	Relative Humidity measured in the Interferometer Enclosure	%
'atmosphericRelativeHumidity'	Relative humidity measured near Blackbodies. Use with Air Temperature Near BBs only.	%
'interferometerWindowTemp'	Interferometer window temperature measured on the outside of the aluminum window flange	degrees_Kelvin
'rainSensorIntensity'	Rain sensor analog output: the rain sensor is located inside the hatch near the sky aperture and is used to flag the critical condition of rain falling on the AERI sky aperture. If rain is detected	millimeters/hour
'detectorTemp'	Detector temperature sensed via diode near detector	degrees_Kelvin
'coolerCurrent'	Stirling cycle cooler current	amperes
'SCEtemp'	Signal conditioning electronics inside air temperature	degrees_Kelvin
'motorDriverTemp'	Scene mirror motor driver heat sink temperature	degrees_Kelvin
'computerTemp'	AERI ingest computer temperature measured at back panel of computer	degrees_Kelvin
'rackAmbientTemp'	Electronics rack ambient temperature measured at inside top of rack	degrees_Kelvin
'coolerPowerSupplyTemp'	Stirling cooler power supply temperature measured at power supply frame	degrees_Kelvin
'coolerExpanderTemp'	Stirling cycle cooler expander temperature	degrees_Kelvin
'coolerCompressorTemp'	Stirling cooler compressor temperature measured at compressor heatsink	degrees_Kelvin
'BBcontroller2temp'	Blackbody controller Unit 2 power supply temperature	degrees_Kelvin
'BBcontroller1temp'	Blackbody controller Unit 1 power supply temperature	degrees_Kelvin
'fixed12KohmResistor'	Resistive temperature of 12 Kohm fixed resistor located in SCE-P3 shell	degrees_Kelvin
'mirrorMotorTemp'	Scene mirror motor case temperature	degrees_Kelvin
'airNearBBsTemp'	Ambient air temperature near blackbodies	degrees_Kelvin
'BBsupportStructureTemp'	Temperature of the AERI blackbody support structure	degrees_Kelvin
'interferometerSecondPortTemp'	AERI interferometer temperature at second port	degrees_Kelvin
'airNearInterferometerTemp'	Ambient air temperature near the interferometer	degrees_Kelvin
'outsideAirTemp'	Ambient air temperature at hatch opening	degrees_Kelvin
'fixed97KohmResistor'	Resistive temperature of 97 Kohm fixed resistor located in SCE-P4 shell	degrees_Kelvin
'fixed2500ohmResistor'	Resistive temperature of 2500 Ohm fixed resistor - banana plug mounted	degrees_Kelvin
'HBBbottomTemp'	Hot blackbody temperature - rim bottom	degrees_Kelvin
'HBBapexTemp'	Hot blackbody temperature - apex	degrees_Kelvin
'HBBtopTemp'	Hot blackbody temperature - rim top	degrees_Kelvin
'ABBbottomTemp'	Ambient blackbody temperature	degrees_Kelvin
'ABBapexTemp'	Ambient blackbody temperature - apex	degrees_Kelvin
'ABBtopTemp'	Ambient blackbody temperature - rim top	degrees_Kelvin
'JulianDay'	Julian Day including day and fraction of day	days
'sceneMirPosEncoder'	Scene mirror position encoder value	count
'sceneMirPosCount'	Number of views in a sequence	count
'sceneMirrorPosition'	Instrument scene mirror position identifier	count
'coadditionsCount'	Number of complete (forward+backward) interferogram scans in sample average	count
'sceneViewDuration'	Duration of scene view	seconds
'systemReleaseNumber'	Version number of Operational Software	count
'Altitude'	Observation Altitude	feet
'Longitude'	Observation longitude	degrees_east
'Latitude'	Observation latitude	degrees_north
'timeHHMMSS'	Time at center of AERI sky observation period	hour.minute.second
'dateYYMMDD'	Observation date	year.month.day
'instrumentUnitNumber'	Character string containing instrument name	count
'AERIunitNumber'	AERI instrument unit serial number	count
'Time'	Time at center of AERI sky observation period	hours
'mean_rad'	Interferometer scan directional average of radiance	mw/(m ² sr cm-1)
'hatchOpen'	hatch open flag. 1 = open	unitless
'time'	Time offset from midnight	seconds since 2014-06-23 00:00:00 0:00 GMT
'qc_time'	Dummy variable for compatibility with ARM AERI files	unitless
'Time_UTC_hours'	Time at center of AERI sky observation period	hours since 2014-06-23 00:00:00 0:00 GMT
'lat'	north latitude	degrees
'lon'	east longitude	degrees
'alt'	altitude	meters above Mean Sea Level
'numberOfPCs'	Number of principal components (PC) in PC noise filtering	None

Contacts

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 Research Scientist: Penny M. Rowe
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Datagrams:
Summit
P-AERI



Contacts

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 Data Support: Sara Crepinsek
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Polar Atmospheric Emitted Radiance Interferometer

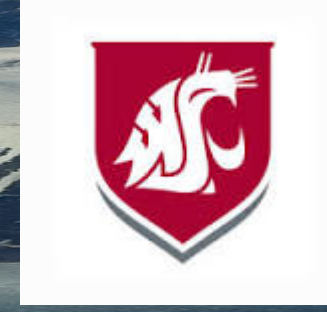
Product netCDF Metadata

File name: smtaerich2nf1turnX1.c1.20141013.000326.cdf		Path: summit\air\processed	
Attributes			
Name	Value		
'Comments'	'tmp.dat'		
'experiment'	Integrated Characterization of Energy, Clouds, Atmospheric State, and Precipitation at Summit (ICECAPS), Pls are Ralf Bennartz, Matthew Shupe, David Turner and Von P. Walden'		
'contact'	'Von P. Walden (v.walden@wsu.edu)'		
'reference_project'	Shupe et al. (2013), Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-11-00249.1.'		
'date_created'	'21-Dec-2014'		
'missing_data_flag'	'-9999'		
'site_id'	'smt'		
'facility_id'	'X1: Summit Greenland'		
'FOVhalfAngle'	'0.0230 radians'		
'FOVhalfAngle_description'	'Field of view half angle used in finite FOV correction'		
'description'	'This dataset contains calibrated and quality-controlled Atmospheric Emitted Radiance Interferometer (AERI) infrared spectral radiances [mW(m ² sr cm ⁻¹) ⁻¹]. These spectra have also been noise-filtered using a Principal Components (PC) technique. See the reference_datastream global attribute for references. Environment and instrument related metadata are also included.'		
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'originalLaserWavenumber_description'	'Original laser wavenumber assumed for this instrument'		
'outputLaserWavenumber'	'15799.00'		
'outputLaserWavenumber_description'	'Laser wavenumber used in definition of output wavenumber scale'		
'originalInterferogramSize'	'8192.0'		
'originalInterferogramSize_description'	'Size of buffer holding initial spectrum'		
'expandedInterferogramSize'	'131072.0'		
'expandedInterferogramSize_description'	'Size of buffer holding expanded spectrum before interpolation'		
'reference_datastream'	Antonelli et al. (2004) J. Geophys. Res., 109, D23102, doi:10.1029/2004JD00482 -and- Turner et al. (2006) J. Atmos. Ocean. Tech., 23, 1223-1238, doi:10.1175/JTECH1906.1.'		
Dimensions			
Name	Length		
'time'	3352		
'wnum'	2531		
'hatch_dim'	3352		
'scalar'	1		
'time2'	3352		
'wavenumber2'	2531		
Variables			
Name	Long name	Units	
'date'	None	None	
'base_time'	Base time in Epoch	seconds	
'wnum'	Wave number in reciprocal centimeters	cm ⁻¹	
'time_offset'	Time offset from base_time	seconds since 2014-10-13 00:03:25 GMT	
'missingDataFlag'	Logical flag indicating that a data record is missing (true/false)	count	
'sceneMirPosEncoderMaxDrift'	Maximum departure from ideal of the mirror position over the course of all contributing views. Typically two hot	count	
'BBcavityFactor'	Blackbody cavity geometry factor	count	
'HBBtempOffset'	Corrective offset for final hot blackbody average temperature	degrees_Kelvin	
'ABBtempOffset'	Corrective offset for final ambient blackbody average temperature	degrees_Kelvin	
'HBBbottomTempWeight'	Weight factor for bottom used in calculating hot blackbody temperature average	%/100	
'HBBapexTempWeight'	Weight factor for apex used in calculating hot blackbody temperature average	%/100	
'HBBtopTempWeight'	Weight factor for top used in calculating hot blackbody temperature average	%/100	
'ABBbottomTempWeight'	Weight factor for bottom used in calculating ambient blackbody temperature average	%/100	
'ABBapexTempWeight'	Weight factor for apex used in calculating ambient blackbody temperature average	%/100	
'ABBtopTempWeight'	Weight factor for top used in calculating ambient blackbody temperature average	%/100	
'calibratedSceneID'	Type of scene that has been calibrated (ASCII character as float)	count	
'calibrationHBBtemp'	Hot blackbody temperature used in calibration	degrees_Kelvin	
'calibrationCBBtemp'	Cold blackbody temperature used in calibration	degrees_Kelvin	
'calibrationAmbientTemp'	Ambient temperature used in calibration	degrees_Kelvin	
'channelNumber'	Instrument data channel number	count	
'sceneMirPosEncoderDrift'	Difference between actual and ideal motor encoder values for current view; indicative of quality of the mirror positioning.	count	
'HBBmaxTempDiff'	Maximum Temperature Difference Between HBB Thermistors	degrees_Kelvin	
'ABBmaxTempDiff'	Maximum Temperature Difference Between ABB Thermistors	degrees_Kelvin	
'maxRoll'	Maximum roll of the interferometer during scan. Roll axis is coincident with the axis of mirror rotation. Zero value indicates level.	degrees	
'maxPitch'	Maximum pitch of the interferometer during scan. Pitch axis is perpendicular to the axis of mirror rotation. Zero value indicates level.	degrees	
'opticsCompartmentRelativeHumidity'	Relative humidity measured in the optics compartment atop the interferometer.	%	
'sceneMirrorMotorStep'	Motor step value given to motor controller to achieve proper mirror positioning	count	
'sceneMirrorAngle'	Scene mirror view angle in non-negative degrees	degrees	
'maxSampleStdDev'	Maximum Standard Deviation in Thermistor Channels 0..7	degrees_Kelvin	
'atmosphericPressure'	Observation atmospheric pressure in AERI electronics	millibars	
'interferometerEnclosureRelativeHumidity'	Relative Humidity measured in the Interferometer Enclosure	%	
'atmosphericRelativeHumidity'	Relative humidity measured near Blackbodies. Use with Air Temperature Near BBs only.	%	
'interferometerWindowTemp'	Interferometer window temperature measured on the outside of the aluminum window flange	degrees_Kelvin	
'rainSensorIntensity'	Rain sensor analog output: the rain sensor is located inside the hatch near the sky aperture and is used to flag the critical condition of rain falling on the AERI sky aperture. If rain is detected	millimeters/hour	
'detectorTemp'	Detector temperature sensed via diode near detector	degrees_Kelvin	
'coolerCurrent'	Stirling cycle cooler current	amperes	
'SCEtemp'	Signal conditioning electronics inside air temperature	degrees_Kelvin	
'motorDriverTemp'	Scene mirror motor driver heat sink temperature	degrees_Kelvin	
'computerTemp'	AERI ingest computer temperature measured at back panel of computer	degrees_Kelvin	
'rackAmbientTemp'	Electronics rack ambient temperature measured at inside top of rack	degrees_Kelvin	
'coolerPowerSupplyTemp'	Stirling cooler power supply temperature measured at power supply frame	degrees_Kelvin	
'coolerExpanderTemp'	Stirling cycle cooler expander temperature	degrees_Kelvin	
'coolerCompressorTemp'	Stirling cooler compressor temperature measured at compressor heatsink	degrees_Kelvin	
'BBcontroller2temp'	Blackbody controller Unit 2 power supply temperature	degrees_Kelvin	
'BBcontroller1temp'	Blackbody controller Unit 1 power supply temperature	degrees_Kelvin	
'fixed12KohmResistor'	Resistive temperature of 12 Kohm fixed resistor located in SCE-P3 shell	degrees_Kelvin	
'mirrorMotorTemp'	Scene mirror motor case temperature	degrees_Kelvin	
'airNearBBsTemp'	Ambient air temperature near blackbodies	degrees_Kelvin	
'BBsupportStructureTemp'	Temperature of the AERI blackbody support structure	degrees_Kelvin	
'interferometerSecondPortTemp'	AERI interferometer temperature at second port	degrees_Kelvin	
'airNearInterferometerTemp'	Ambient air temperature near the interferometer	degrees_Kelvin	
'outsideAirTemp'	Ambient air temperature at hatch opening	degrees_Kelvin	
'fixed97KohmResistor'	Resistive temperature of 97 Kohm fixed resistor located in SCE-P4 shell	degrees_Kelvin	
'fixed2500ohmResistor'	Resistive temperature of 2500 Ohm fixed resistor - banana plug mounted	degrees_Kelvin	
'HBBbottomTemp'	Hot blackbody temperature - rim bottom	degrees_Kelvin	
'HBBapexTemp'	Hot blackbody temperature - apex	degrees_Kelvin	
'HBBtopTemp'	Hot blackbody temperature - rim top	degrees_Kelvin	
'ABBbottomTemp'	Ambient blackbody temperature	degrees_Kelvin	
'ABBapexTemp'	Ambient blackbody temperature - apex	degrees_Kelvin	
'ABBtopTemp'	Ambient blackbody temperature - rim top	degrees_Kelvin	
'JulianDay'	Julian Day including day and fraction of day	days	
'sceneMirPosEncoder'	Scene mirror position encoder value	count	
'sceneMirPosCount'	Number of views in a sequence	count	
'sceneMirrorPosition'	Instrument scene mirror position identifier	count	
'coadditionsCount'	Number of complete (forward+backward) interferogram scans in sample average	count	
'sceneViewDuration'	Duration of scene view	seconds	
'systemReleaseNumber'	Version number of Operational Software	count	
'Altitude'	Observation Altitude	feet	
'Longitude'	Observation longitude	degrees_east	
'Latitude'	Observation latitude	degrees_north	
'timeHHMMSS'	Time at center of AERI sky observation period	hour:minute:second	
'dateYYMMDD'	Observation date	year:month:day	
'instrumentUnitNumber'	Character string containing instrument name	count	
'AERIunitNumber'	AERI instrument unit serial number	count	
'Time'	Time at center of AERI sky observation period	hours	
'mean_rad'	Interferometer scan directional average of radiance	mw/(m ² sr cm ⁻¹)	
'hatchOpen'	hatch open flag, 1 = open	unitless	
'time'	Time offset from midnight	seconds since 2014-10-13 00:00:00 0:00 GMT	
'qc_time'	Dummy variable for compatibility with ARM AERI files	unitless	
'Time_UTC_hours'	Time at center of AERI sky observation period	hours since 2014-10-13 00:00:00 0:00 GMT	
'lat'	north latitude	degrees	
'lon'	east longitude	degrees	
'alt'	altitude	meters above Mean Sea Level	
'numberOfPCs'	Number of principal components (PC) in PC noise filtering	None	

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Polar Atmospheric Emitted Radiance Interferometer

Product netCDF Metadata

Table with columns: Attribute, Value, Units. Contains metadata for 'smtaerisummaryX1.b1.20131006.000304.cdf' including instrument details, dimensions, and variables.