GSICS Information Services and Products Roster (GISPR)

Drs. Fuzhong Weng and *Robert Iacovazzi, Jr.*

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A Synopsis

This GISPR is a list of potential and current GSICS information services and products

Currently, this document is meant for internal use within GSICS to help define current GSICS assets, and to prioritize future GSICS activities

The plan for this document is to split it into two documents:

- GISP Brochure – A web-based guide of currently offered GSICS information services and products
- GISP Survey – A list all of products and services that the GSICS data user community *would like* GSICS to offer. This Survey is to be sent around to GSICS data users for comments and suggestions regarding their GSICS data needs

Satellite Instrument Information

Wish List	Mode	Priority	Available Now List (*online but none linked to the GSICS web site*)	Mode
❖Instrument characteristic/specifications, calibration protocols, and data formats for all instruments (see Appendices 1.A and 1.B)	web		❖Instrument characteristic/specifications, calibration protocols, and data formats for all EUMETSAT, NASA, and NOAA instruments listed in Appendices 1.A and 1.B	web
❖Instrument log of maneuvers and events – e.g. yaw, pitch, roll maneuvers; scan mode changes; etc.	web		❖Instrument log of maneuvers and events for NOAA satellites	web
❖Vis/IR channel spectral response functions (SRFs)	web		❖Some NOAA and NASA Vis/IR channel SRFs	web
❖Vis/IR channel modulation transfer functions (MTFs)	web		❖Some NOAA and NASA Vis/IR channel MTFs	web
❖Microwave instrument antenna patterns	web		❖Some NOAA and NASA microwave instrument antenna patterns	web
❖Limited pre- and post-launch instrument test information – e.g. response versus scan angle; live, marginal, and dead detectors, blackbody emissivity, solar diffuser BRDF, etc.	sftp		❖Post-launch information for GOES Imager and Sounder, EOS Aqua AIRS and MODIS	web

Instrument Performance Monitoring

Wish List	Mode	Priority	Available Now List	Mode
❖Statistical analyses of calibration-relevant parameters – e.g. blackbody temperature; space- and blackbody-view counts, scan motor temperature, calibration anomaly flags, etc			❖Statistical analyses of calibration-relevant parameters – e.g. blackbody temperature; space- and blackbody-view counts, scan motor temperature, calibration anomaly flags, etc	
►Operational geostationary- and polar-orbiting satellite instruments listed in Appendix 1.A and 1B.			►NOAA-18 and MetOP-A AMSU-A, HIRS, and MHS; MetOP-A AVHRR; and GOES-11 and GOES-12 Imagers.	
▪ Graphs of instrument character for periods of days/weeks/months/years	web		▪ Graphs of recent/historical instrument character at various time scales	web & local
▪ Tables of instrument character since launch	sftp		▪ Some tables of instrument character since launch	web & local
❖E-mail alerts and quarterly anomaly assessment reports in the *GSICS Anomaly Sentinel*	email		❖E-mail alerts for NOAA-18 and MetOP-A AMSU-A and MHS instruments. Major instrument anomalies presented in the *GSICS Quarterly* newsletter.	email

LEO-LEO Inter-Calibration

Wish List	Mode	Priority	Available Now List	Mode
❖Radiance biases, bias uncertainties and quality assessments based mainly on collocated SNO data sets and textbook statistical techniques – e.g. mean, standard deviation, standard error, correlation, etc.			❖Radiance biases, bias uncertainties and quality assessments based mainly on collocated SNO data sets and textbook statistical techniques – e.g. mean, standard deviation, standard error, correlation, etc. (see Appendix 2)	
►Operational and historical polar-orbiting satellite instruments listed in Appendix 1.B			►Operational EUMETSAT, NASA, and NOAA polar-orbiting satellite instruments listed in Appendix 1.B. Some historical NOAA polar-orbiting satellite instruments	
▪ SNO collocation and comparison data sets in NetCDF4 format	sftp		▪ SNO collocation and comparison data sets	local
▪ Graphs/Tables of results (see Appendix 2 for relevant parameters and analyses)	web/ sftp		▪ Graphs/Tables of results (see Appendix 2 for relevant parameters and analyses)	web/ web
❖SNO predictions			❖SNO predictions	
►Between current operational polar-orbiting satellites listed in Appendix 1.B			►Between current operational EUMETSAT, NASA, and NOAA polar-orbiting satellites listed in Appendix 1.B	
▪ Tables of SNO opportunities	sftp		▪ Output in ascii format (*not linked to GSICS web site)*	web

GEO-LEO Inter-Calibration

Wish List	Mode	Priority	Available Now List	Mode
❖Calibration coefficients and/or radiance biases, bias uncertainties and quality assessments based on data sets collocated in space, time, and zenith/azimuth viewing angle and analyzed using textbook statistical techniques – e.g. mean, standard deviation, standard error, correlation, … etc. (TBD)			❖Research and development of inter-comparison algorithms is currently being performed, and some results have been generated. Currently, most results are not available for routine release.	local
►Operational and historical operational geostationary-orbiting satellite instruments (see Appendix 1.A) inter-compared with with NASA (Hyperion and AIRS) and EUMETSAT (IASI) polar-orbiting hyperspectral satellite instruments				
▪ Collocation and comparison data sets in NetCDF4	sftp			
▪ Graphs/Tables of results	web/ sftp			
❖Predictions of dates and times when LEO satellites are within GEO satellite field of view				
►Between operational geostationary-orbiting satellites and polar-orbiting satellites that contain hyperspectral instruments.				
▪ Tables of event opportunities	sftp			

Spectral Calibration

Wish List	Mode	Priority	Available Now List	Mode
❖SRF-related inter-satellite radiance biases estimated between broadband channels using RTM models and available hyperspectral instruments – e.g., EOS-Aqua AIRS, MetOP IASI, and EO-1 Hyperion			❖SRF-related inter-satellite radiance biases estimated between *some* broadband channels using RTM models and available hyperspectral instruments – e.g., EOS-Aqua AIRS and MetOP IASI	
►Graphs/Tables of results similar to those of GEO-LEO and LEO-LEO inter-calibration	web/ sftp		►Graphs/Tables of SRF-related AVHRR−MODIS Tb biases estimated using AIRS, and HIRS-HIRS Tb biases estimated using IASI	reports
❖SRF shifts assessed through comparison of VIS/IR broadband measurements with those convolved from hyperspectral instruments – e.g., EOS-Aqua AIRS, MetOP IASI, and EO-1 Hyperion	web		❖SRF shifts assessed for GOES Imager using IASI and for HIRS using AIRS	reports & print

Spatial Calibration

Wish List	Mode	Priority	Available Now List	Mode
❖Navigation assessed by analyzing the coincidence of satellite images and standard coastline maps. This analysis is carried out for all GEO and LEO satellite instruments listed in Appendices 1.A and 1.B	web		❖Navigation of Vis/IR NOAA LEO satellite instruments listed in Appendix 1.B analyzed by assessing the coincidence between satellite images and standard coastline maps	web
❖Focal plane co-alignment analysis performed using Lunar images for all GEO satellite instruments listed in Appendix 1.A	web		❖Focal plane co-alignment analysis for EOS MODIS performed using Lunar images	web

Vicarious Cal of Solar Reflective Chs

Wish List	Mode	Priority	Available Now List	Mode
❖Time series of reflectance, reflectance factor, or normalized reflectance			❖Time series of reflectance, reflectance factor, or normalized reflectance	
►3-Axis Stabilized Geostationary Satellite			►GOES 3-Axis Stabilized Geostationary Satellite	
▪ Desert site – e.g., Sonora Desert	web		▪ Desert site – e.g., Sonora Desert	web
▪ Moon	web		▪ Moon	local
▪ Stars	web		▪ Stars	web
▪ Tropical deep convective cloud	web		▪ Tropical deep convective cloud	print
►Low-Earth-Orbit Satellites			►POES and NASA Low-Earth-Orbit Satellites	
▪ Desert site – e.g., Sonora Desert, Libyan Desert, Taklimakan Desert, Lop Nur, Dome Concordia.	web		▪ Desert site – e.g., POES AVHRR (Libyan Desert, Taklimakan Desert), NASA MODIS (Taklimakan Desert, Lop Nur, Dome Concordia)	reports
▪ Moon	web		▪ Moon – NASA MODIS, SeaWifs, VIRS	web+ print
▪ Tropical deep convective cloud	web		▪ Tropical deep convective cloud – NASA GOES, VIRS	print
❖Prediction of LEO satellite overpasses of desert sites and the location of the Moon and stars in the GEO field of view	sftp		❖Prediction of LEO satellite overpasses of desert sites and the location of the Moon and stars in the GEO field of view	local

Radiative Transfer Model Simulation of Satellite Instrument Radiances

Wish List	Mode	Priority	Available Now List	Mode
❖Simulation at reference sites. RTM input parameters are defined using actual sounding and surface measurements. Performed for all applicable satellite instruments given in Appendices A.1 and A.2			❖Simulation at reference sites. RTM input parameters are defined using actual sounding and surface measurements. Performed for all applicable satellite instruments given in Appendices A.1 and A.2	
►Atmospheric Radiation Measurement (ARM) sites	sftp		►For Atmospheric Radiation Measurement (ARM) site in Barrow, Alaska - Line-by-Line RTM input parameters are defined using actual sounding and surface measurements. This is performed for NOAA POES HIRS and EOS Aqua AIRS radiances	local
►GCOS Reference Upper Air Network (GRUAN) sites	sftp			
❖Simulation at Numerical Weather Prediction (NWP) model grids. RTM input parameters are defined using sounding and surface reanalysis. Performed for all applicable satellite instruments given in Appendices A.1 and A.2 used for NWP			❖Simulation at NWP model grids. RTM input parameters are defined using sounding and surface reanalysis. Performed for all applicable satellite instruments given in Appendices A.1 and A.2 that are used for NWP	
►National Centers of Environmental Prediction (NCEP) and European Center for Medium Range Forecasting (ECMWF)	web		►DMSP SSM/IS and NOAA POES AMSU-A bias corrections performed at all major NWP centers. *Performed on a regular basis, but not available through GSICS*	web
			►For CMA FY-2 C/D VISSR, calibration of the infrared channels over ocean cloud-free areas by comparison with radiances simulated by MODTRAN applied to surface data from ocean buoys and NCEP global model atmospheric profiles	
❖Prediction of satellite near-overpass events to reference sites for satellites given in Appendices A.1 and A.2	sftp		❖Prediction of satellite near-overpass events to reference sites for satellites given in Appendices A.1 and A.2	local

Inter-comparison with Aircraft SI-Traceable Radiometers

Wish List	Mode	Priority	Available Now List	Mode
❖VIS/Near-IR Instrument Channels ►Airborne Visible/InfraRed Imaging Spectrometer (AVIRIS)				
▪ Data and analysis from field campaigns	sftp			
❖IR Instrument Channels ►Scanning High-resolution Interferometer Sounder (S-HIS)			❖IR Instrument Channels ►Scanning High-resolution Interferometer Sounder (S-HIS)	
▪Data and analysis from field campaigns	sftp		▪ Data and analysis from field campaigns o 2002 Terra/Aqua Experiment (TX-2002) S-HIS inter-comparisons with MODIS and AIRS o 2007 Joint Airborne IASI Validation Experiment (JAIVEx) comparisons of S-HIS airborne instrument with MetOP-A and NASA EOS satellite instruments	web & print
►NPOESS Atmospheric Sounder Testbed – Interferometer (NAST-I)			►NPOESS Atmospheric Sounder Testbed – Interferometer (NAST-I)	
•Data and analysis from field campaigns	sftp		• Data and analysis from field campaigns o 2002 Terra/Aqua Experiment (TX-2002) NAST-I inter-comparisons with MODIS and AIRS o 2007 Joint Airborne IASI Validation Experiment (JAIVEx) comparisons of NAST-I airborne instrument with MetOP-A and NASA EOS satellite instruments	web & print

Inter-comparison with Aircraft SI-Traceable Radiometers

Wish List	Mode	Priority	Available Now List	Mode
❖Microwave Instrument Channels ►NPOESS Atmospheric Sounder Testbed – Microwave (NAST-M)			❖Microwave Instrument Channels ►NPOESS Atmospheric Sounder Testbed – Microwave (NAST-M)	
▪Data and analysis from field campaigns	sftp		▪ Data and analysis from field campaigns o 2007 Joint Airborne IASI Validation Experiment (JAIVEx) comparisons of NAST-M airborne instrument with MetOP-A and NASA EOS satellite instruments	presentation
❖RTM used to correct effects due to atmosphere intervening between aircraft and satellite, as well as for scan angle differences			❖RTM models used to correct effects due to atmospheric intervening between aircraft and satellite, as well as for scan angle differences	
❖Results of standards laboratory inter-comparisons between aircraft instruments and radiometers	sftp		❖JAIVEx results of inter-comparisons between aircraft instruments and radiometers from NIST	print

GSICS Product Guides and Communication Tools

Wish List	Mode	Priority	Available Now List	Mode
GSICS Product Guides			*GSICS Product Guides*	
❖Algorithm Theoretical Basis Document (ATBD) – Describes the methodologies implemented in creating the product	TWiki		❖GEO-LEO inter-calibration ATBD and publications in journals, and LEO-LEO inter-calibration publications in journals	local & print
❖Data Users Guide – Basic product information; file naming conventions; and data parameter, format, and quality descriptions – e.g., uncertainty estimate procedures and results	TWiki		❖Detailed lists of product variables and software algorithm flowcharts for instrument performance monitoring and LEO-LEO inter-calibration	web
❖GSICS Product Application Guide – Describes directions how to use GSICS data to assess or reprocess raw satellite data			❖MHS instrument performance monitoring system flowcharts	local
GSICS Communication Tools			*GSICS Communication Tools*	
❖GSICS Web Site and Web Portal			❖GSICS Web Site	
❖Collaborative Data Servers				
❖TWiki				
❖Mail List Server				
❖*GSICS Quarterly* e-newsletter			❖*GSICS Quarterly* e-newsletter	
❖*GSICS Anomaly Sentinel* publication				
❖GSICS Executive Panel, GRWG, and GDWG Meetings			❖GSICS Executive Panel, GRWG, and GDWG Meetings	

Current GEO Satellite Instruments Serviced by GSICS

Agency	Satellite	Sensor
NOAA	GOES	Imager
NOAA	GOES	Sounder
EUMETSAT	MFG	MVIRI (Meteosat Visible and InfRared Imager)
EUMETSAT	MSG	SEVIRI (Spinning Enhanced Visible and Infrared Imager)
JMA	GMS	VISSR (Visible and Infrared Spin Scan Radiometer)
JMA	MTSAT	Imager
KMA	COMS	Meteorological Imager
CMA	FY-2	VISSR (Visible and Infrared Spin Scan Radiometer)

Current LEO Satellite Instruments Serviced by GSICS

Agency	Satellite	Sensor
CMA	FY-1	VISR (Visible and Infrared Scanning Radiometer)
CMA	FY-3	VIRR (Visible and InfraRed Radiometer)
CMA	FY-3	MERSI (MEdium Resolution Spectral Imager)
CMA	FY-3	MWRI (MicroWave Radiation Imager)
CMA	FY-3	IRAS (InfraRed Atmospheric Sounder)
CMA	FY-3	MWTS (MicroWave Temperature Sounder)
CMA	FY-3	MWHS (MicroWave Humidity Sounder)
CMA	FY-3	TOU (Total Ozone Unit)
NOAA	POES	SBUS (Solar Backscatter Ultraviolet Sounder)
NOAA	POES	ERM (Earth Radiation Measurement)
NOAA	POES	SIM (Solar Irradiance Monitor)
NOAA	POES	AVHRR (Advanced Very High Resolution Radiometer)
NOAA	POES	HIRS (High-resolution InfraRed Sounder)
EUMETSAT	MetOp	AMSU (Advanced Microwave Sounding Unit)
EUMETSAT	MetOp	MHS (Microwave Humidity Sounder)
EUMETSAT	MetOp	SBUV (Solar Backscatter UltraViolet)
EUMETSAT	MetOp	AVHRR
EUMETSAT	MetOp	HIRS
EUMETSAT	MetOp	AMSU
EUMETSAT	Metop	IASI (Infrared Atmospheric Sounding Interferometer)

Current LEO Satellite Instruments Serviced by GSICS (cont.)

Agency	Satellite	Sensor
NASA	EOS	MODIS (Moderate Resolution Imaging Spectroradiometer)
NASA	EOS	AIRS (Atmospheric InfraRed Sounder)
NASA	EOS	AMSU
NASA	EO-1	Hyperion