

HISUI Status toward 2019 Launch

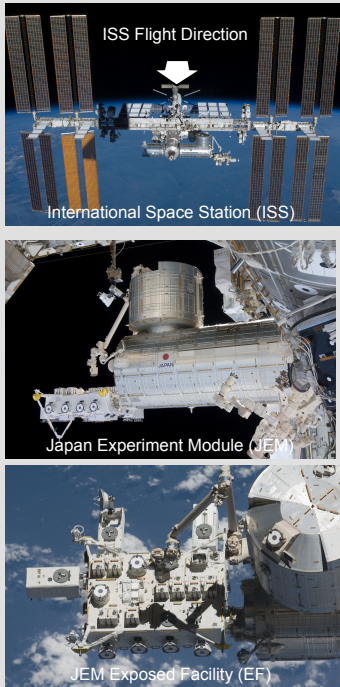
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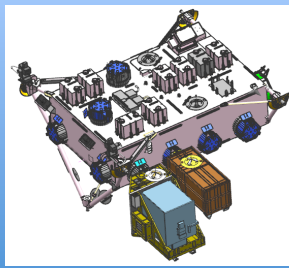
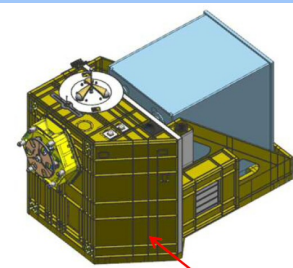
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Abstract

Hyperspectral Imager Suite (HISUI) is a spaceborne imaging spectrometer being developed by Ministry of Economy, Trade, and Industry (METI) of Japan for the deployment on International Space Station (ISS) Japan Experiment Module Exposed Facility (JEM EF). HISUI will be launched by Space-X in FY2018 or later. The procedures to transfer HISUI instrument from J-spacesystems to ISS via US and HISUI data from ISS to J-spacesystems are intensively discussed by J-spacesystems, JAXA, NASA, and Space-X. The development of HISUI GDS is ongoing including Level1 / Level 2 processing and the operation/mission planning subsystems.



Hyperspectral Imager Suite (HISUI)



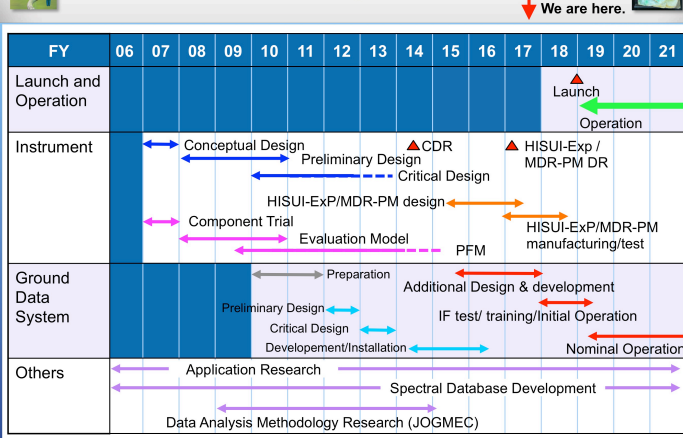
HISUI Product Description

Level 0	Raw data
Level 1A	Raw DN product with all radiometric calibration coefficients. Spatial resampling is not applied.
Level 1R	Top-of-atmosphere spectral radiance product. Spatial resampling is not applied.
Level 1G	Geometrically corrected / orthorectified top-of-atmosphere spectral radiance product. Inter-telescope registration, parallax correction, and keystone property are considered. Spectral continuity between VNIR and SWIR are considered.
Level 2	Atmospherically corrected surface spectral reflectance product generated from L1G with QA information. This is Science Product for research purpose and not validated.

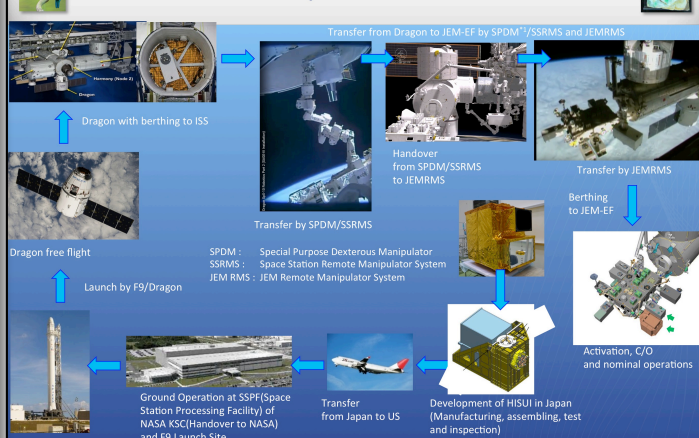
HISUI Specifications

Imaging Type		Pushbroom
Spatial Resolution / Swath		20 m (CT) x 30 m (AT) / 20 km
Spectral	Bands	185 bands in 0.4 – 2.5 μm
	Resolution	10 – 12.5 nm
SNR (30% albedo)		≥ 450 @620 nm ≥ 300 @2100 nm
MTF		≥ 0.2
Dynamic Range		Saturated at 70% albedo
Spectral Calibration		VNIR : 0.2 nm SWIR :0.625 nm
Radiometric Calibration		Absolute : ±5%, among bands :±2%
Quantization		12 bits
Data Rate (70% Lossless Compression)		0.4 Gbps
One Scene (70% Lossless Compression)		≈ 120 MB/scene
Maxium Data Acquisition and Maximum Segments per Orbit		8 min / ≈ 200 scenes per orbit 3 segments per orbit

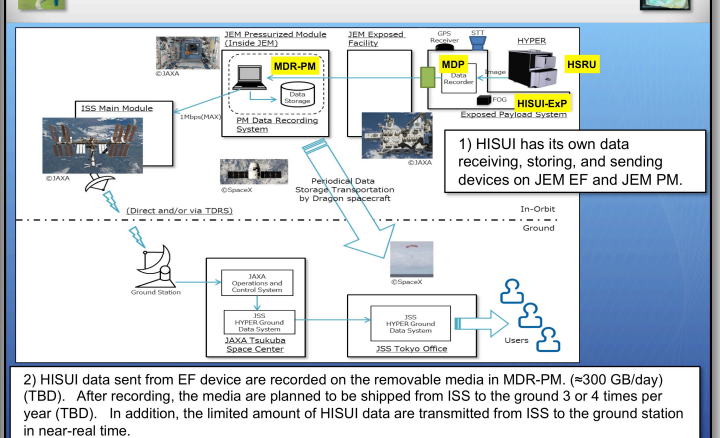
HISUI Schedule as of July 2017



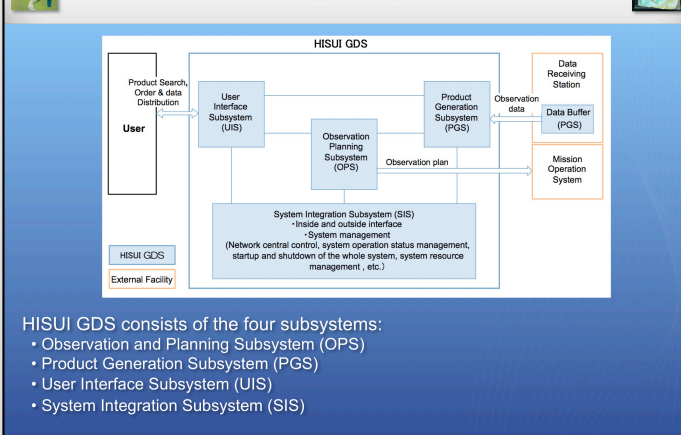
HISUI-Exp's Journey from Ground to ISS JEM EF



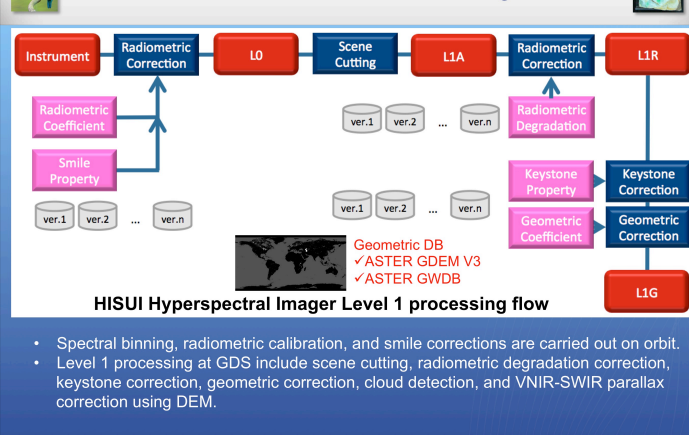
HISUI Data Flow



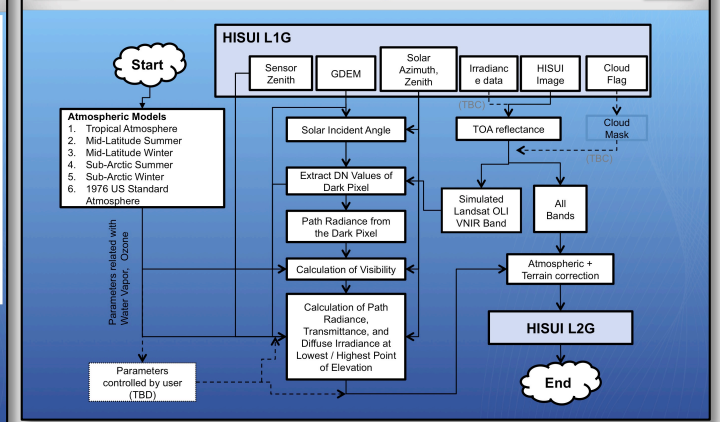
HISUI Ground Data System (GDS) Status



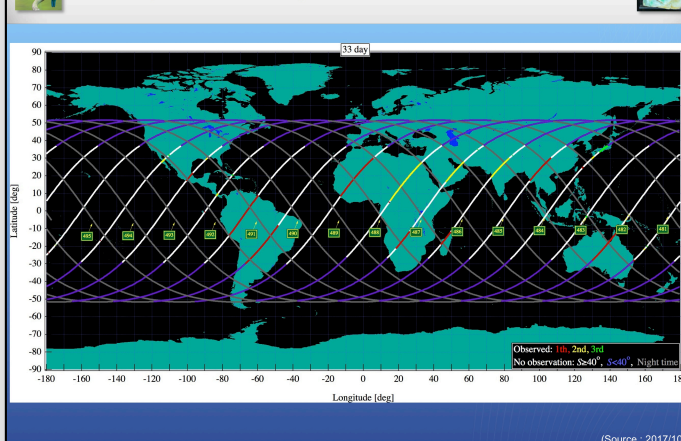
HISUI Onboard and Level 1 Processing



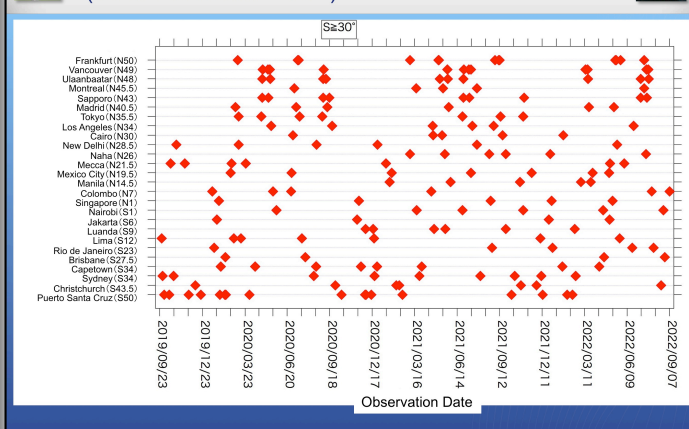
Schematic Flowchart of the HISUI L2G/ Atmospheric Correction Algorithm



Example of One-day Observation of HISUI



Observation Opportunities in Three Years (Solar Elevation $\geq 30^\circ$)



Sequence to Generate Observation Plan of HISUI Using HISUI Scheduling Algorithm

