

Solar Ultraviolet Imaging Telescope onboard Aditya-L1

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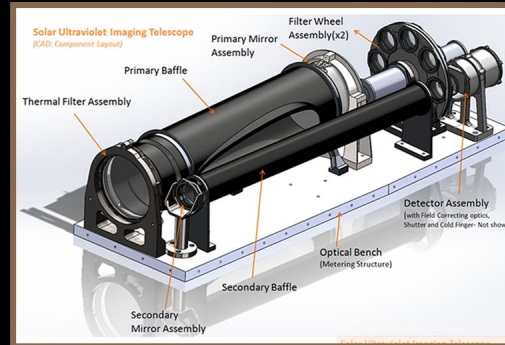
Scientific Objectives

SUIT on-board Aditya-L1 mission will open up an unprecedented observing mode of the Sun at near UV domain (between 200-400nm), with a combination of filters with medium and narrow bandwidth. It will provide near simultaneous 24x7 observations of the various layers of the Sun from photosphere to lower transition region that will help to address the following questions:

- A. Coupling and Dynamics of the Solar Atmosphere:** What are the processes through which the energy is channelized and transferred from the photosphere to the chromosphere and then to the corona?
- B. Prominence Studies from SUIT:** What are the mechanisms responsible for stability, dynamics and eruption of solar prominences?
- C. Initiation of CMEs and Space Weather:** What are the kinematics of erupting prominences during the early phase?
- D. Sun-Climate studies with SUIT:** How strongly does the solar irradiance of relevance for the Earth's climate vary?

Instrument Details

Telescope configuration	Off axis Ritchey-Chretien
Detector	Back illuminated, 4096x4096 CCD
Pixel Size	12 micron
Resolution	0.7 arcsecond/pixel
Field of View	~48 sq. arcminutes



SUIT Science Filters

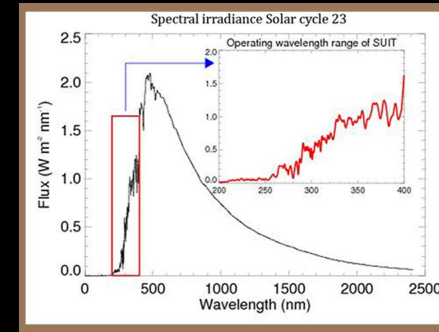
S. No.	Centre (nm)	Bandpass (nm)	Description	Cadence	Science
1	214	<5	Photosphere	30 s	Dynamics
2	274.7	0.4	Wing of Mg II k	30 s	Sun Climate
3	279.6	0.4	Mg II k	30 s	Sun Climate, Dynamics, eruptions
4	280.3	0.4	Mg II h	30 s	Sun Climate, Dynamics, eruptions
5	283.2	0.4	Wing of Mg II h	30 s	Sun Climate
6	300	1	Sunspots	30 s	Dynamics
7	388	1	Lower Photosphere	30 s	Dynamics
8	397.8	0.1	Ca II	30 s	Dynamics
9	200-242	42	Continuum: Photo-dissociation of Oxygen	30 min	Sun Climate
10	242-300	58	Continuum: Photo-dissociation of Ozone	30 min	Sun Climate
11	320-360	40	Continuum: Photo-dissociation of Ozone	30 min	Sun Climate

Uniqueness of SUIT

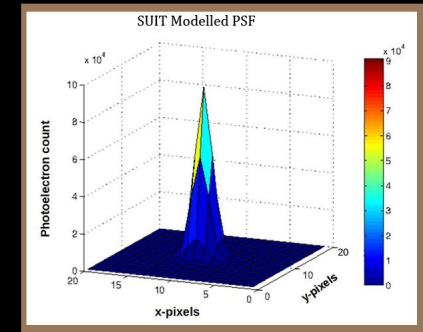
- A. SUIT will provide observations of the Sun 24 x 7.
- B. SUIT will observe the bright as well as dark features on the Sun's surface with signal to noise ratio (SNR) of 100.
- C. Detector with high dynamic range along with mirrors with low surface micro-roughness and low overall particulate contamination is being used to meet the science requirement.
- D. On board intelligence provides the opportunity to switch from normal mode to flare mode of observation.

Performance modelling

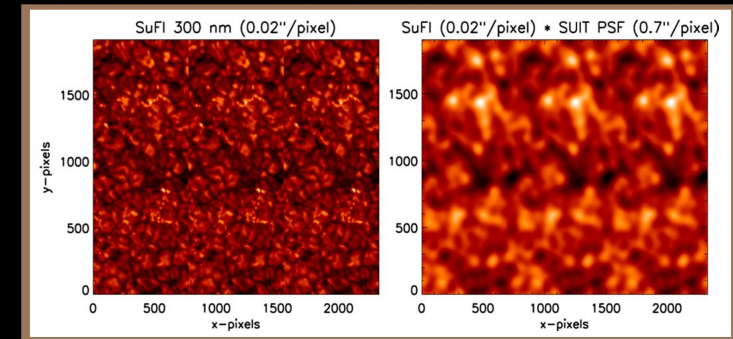
Solar spectral irradiance between 200-400 nm



SUIT Modelled PSF (0.7"/pixel)



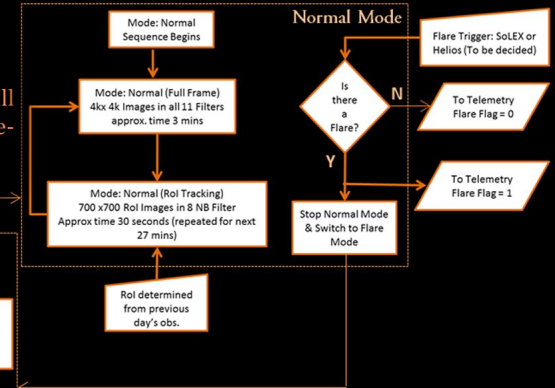
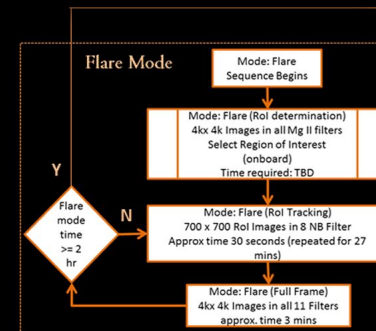
SUIT Modelled PSF (0.2"/pixel) Convolved with SuFI 300 nm image (0.02"/pixel)



Operational Modes

SUIT has two operational modes:

A. Normal Mode: In which it will take images 24 x 7 based on a pre-determined procedure



B. Flare Mode: Which is triggered by an flare event (external trigger provided by SoLEX/HELIOS) during which it will take images of flare events