Full disk spectropolarimetry using a multi-slit spectrometer

Alexandra Glenn, Haosheng Lin University of Hawai'i at Mānoa Institute for Astronomy

Parameter

Field of view

Spatial Spatial Spectral resolution sampling size resolution

0.7 x 0.75 deg

1" for 15-cm telescope at 630 nm







ABSTRACT

The SpectroPolarimetric Imager for the Energetic Sun (SPIES) is a 12U CubeSat full disk, multi-slit spectropolarimeter for measurement of the vector magnetic fields of the sun based on the massively-multiplexed SPECtroheligraph (mxSPEC) concept (Lin 2012). In order to fit within a 6U volume SPIES has several folds in the optical path, and each optical surface introduces polarization cross-talk between the Stokes parameters to the polarization measurement. SPIES mock-up is a 15-cm aperture proof of concept instrument designed to demonstrate the feasibility of SPIES optical design. SPIES mock-up follows the same optical path of SPIES for CubeSat, and will allows us to assess the endto-end polarization cross talk of the instrument. SPIES mock-up has been constructed and is currently been tested in the If A Maui facility. It is scheduled to be commissioned in this summer. It will be operated at the Mees Solar Observatory to provide synoptic vector magnetic field measurements of the full Sun at cadence of one minute to enable studies of the dynamic evolution of the magnetic fields during energetic solar eruption.

Spectral window size

Cac

0.5"/pixel

 $\lambda/55,000$

 $\lambda/500$



tence	Spectral line coverage	Polarization measurement	Polarization sensitivity
S	Fe I 630nm	Full stokes polarimetry	1.5e-3 per pixel per minute

Mulit-slit	Detector	Detector
spectroscopy	format	frame rate
25 slits	7920 x 6004	