



Narrow-band Imager for Multi-Application Solar Telescope (MAST) at Udaipur Solar Observatory

A. Raja Bayanna, Shibu K. Mathew, Parameswaran Venkatakrisnan, and Nandita Srivastava
Udaipur Solar Observatory, Physical Research Laboratory, Udaipur, India (bayanna@prl.res.in, +91-294-2457208)

Multi-Application Solar Telescope (MAST) is an off-axis Gregorian solar telescope of 50 cm clear aperture installed at the lake site of Udaipur solar observatory (USO). A narrow band imager is being developed for near simultaneous observations of the solar atmosphere at different heights. The heart of the system is two Fabry-Perot (FP) etalons working in tandem. The substrate of the etalons is made of Lithium Niobate electro-optic crystal. The filter is tuned by changing the refractive index of the crystal with the application of the voltage. It is important to know the voltage required per unit wavelength shift to tune the system for different wavelength regions for near simultaneous observations. A Littrow spectrograph was set up to calibrate the FP etalons. The achieved spectral resolution with the spectrograph at 6173 Å is 35 mÅ. Calibration is carried-out for the Fe I 6173 Å, H-alpha 6563 Å and Ca K 8542 Å. Free spectral range (FSR) obtained for FP1 and FP2 in tandem for 6173 Å is 6.7 Å and 150 mÅ respectively. Voltage range of the system allows us to scan the entire line profile of 6173 in the range of ± 220 mÅ with a sampling of 20 mÅ. We also performed temperature tuning and voltage tuning of the system. Similar exercise is performed for other two wavelengths. Here we present the details of the calibration set-up and obtained parameters and first-light results of the system.