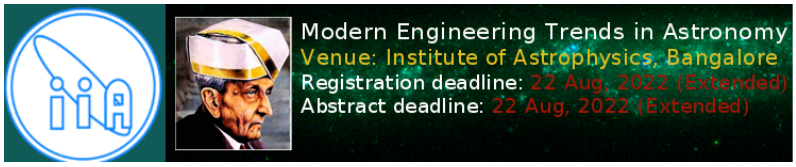

Contribution ID: **26** Type: **not specified**

ASSESSING THE PERFORMANCE OF A DIGITAL MICROMIRROR DEVICE (DMD) BASED MULTI-OBJECT SPECTROGRAPH (MOS) FOR THE INDIAN SPECTROSCOPIC AND IMAGING SPACE TELESCOPE (INSIST)

The coming decade in astronomy focuses on large wide field imaging and spectroscopic surveys. At present, no wide field imaging or multi-object spectroscopic facilities extend to the UV region, which represents an important window into a wide variety of astrophysical problems. Combining a large focal area with a simple and efficient optical design, the Indian Spectroscopic and Imaging Space Telescope (INSIST) is a UV-optical 1m class telescope expected to produce very high quality images and moderate resolution spectra of astronomical sources. INSIST will allow astronomers to probe a variety of science drivers, ranging from the physical and chemical properties of stellar systems, galaxy evolution in groups and clusters, chemo-dynamics and demographics of the nearby universe, to near- and far-field cosmology.

INSIST plans to tackle these challenges using a digital micromirror device (DMD) based multi-object spectrograph (MOS). DMD is a binary light modulator that consists of a programmable rectangular array of 1920x1080 square micromirrors, each of which can be tilted between two stable states, at +12 and -12 degrees from the device normal. The micromirrors of the DMD will act as slits, either reflecting light towards or away from the spectrograph. The MOS covers a wavelength range of 150 nm - 300 nm and delivers a resolving power of ~600 at the mean wavelength.

DMD is to be used in a telescope in the UV region for MOS application for the first time in space. Hence, it is necessary to understand and study the functionality of DMD and its suitability to space telescopes. The work presented here focuses on testing the performance and functionality of the DMD in the optical region. Some of the performance metrics explored are the extent of the spectra, repeatability of the micromirrors, optical contrast ratio, reflectivity studies, to name a few. We design a system with an imaging channel and a spectrograph channel with the DMD, and report on the various results obtained.

Presentation type

Oral

Primary authors: HOODATI, ANWESHA (INDIAN INSTITUTE OF ASTROPHYSICS); JAINI, Akhil (Indian Institute of Astrophysics); KOLLANNUR THARAYIL HOUSE, Della (Christ University); SRIPADMANABAN, Sriram (Indian Institute of Astrophysics)

Presenter: HOODATI, ANWESHA (INDIAN INSTITUTE OF ASTROPHYSICS)