



भारतीय ताराभौतिकी संस्थान
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स्नातक अध्ययन मंडल Board of Graduate Studies

IIA - CU - PhD (Tech) Public Ph.D viva-voce examination

वक्ता **Speaker:** Nirmal K

शीर्षक Title: DEVELOPMENT OF A SPATIAL HETERODYNE SPECTROMETER AND ASSOCIATED INSTRUMENTATION FOR SPACE AND GROUND OBSERVATORIES

सार Abstract

We describe the development of compact, lightweight payloads suitable for ground, space, and balloon-based observatories. The first instrument is a compact high resolution (> 20000) tunable spatial heterodyne spectrometer (TSHS). Spatial Heterodyne Spectroscopy (SHS) is a relatively novel interferometric technique similar to the Fourier transform spectroscopy with heritage from the Michelson Interferometer. An imaging detector is used at the output of an SHS to record the spatially-heterodyned interference pattern. The spectrum of the source is obtained by Fourier transforming the recorded interferogram. Since these instruments do not have slits, the entire incoming beam can be used to generate the spectrum. The small bandwidth limitation of the SHS can be overcome by building it in a tunable configuration (TSHS). This instrument can be used to observe and study faint, extended emission line targets by retrieving the high-resolution spectra from the entire source.

The second instrument is a pointing system suitable for balloon mission. Our first balloon observations were of atmospheric lines where the pointing stability is less critical, but now we are observing astronomical sources for which a pointing mechanism is required. Hence, in this work, we describe the design and realization of a low-cost light-weight 2-axis correction pointing and stabilization system intended for use in small balloon flights, built entirely using off-the-shelf components with an accuracy of 0.5 degrees.

सोमवार Monday 5, अक्टूबर October 2020

Time: 14:30 Hrs

Online

सभी का स्वागत है All are welcome