भारतीय खगोलभौतिकी संस्थान
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स्नातक अध्ययन मंडल Board of Graduate Studies.

STUDENT SEMINAR
(Part of Comprehensive Examination)

Speaker: Mr. Devang Agnihotri

Title: Hanle effect in Ca I 4227 A line polarization using magnetohydrodynamic simulations of the solar atmosphere: Bifrost vs. MURaM

सार Abstract

Scattering polarization in strong resonance lines such as the Ca I 4227 A, formed in the Solar chromosphere can probe the weak magnetic fields via the Hanle effect. Primarily one-dimensional (1D) semi-empirical model atmospheres were used to study the linear polarization in this line. However, these atmospheres do not entirely represent the realism of the solar atmosphere and cannot always reproduce the observed Stokes profiles. Thus, using these atmospheres to model observations and determine the solar magnetic fields has limited applicability. Therefore, in this work we study the Hanle effect in Ca I 4227 A line using the state-of-the-art three-dimensional (3D) magnetohydrodynamic (MHD) simulations of the solar atmosphere from the radiative MHD codes Bifrost and MURaM. We extract the vertical 1D rays from the 3D simulation boxes and perform 1.5D polarized radiative transfer along these rays. We compute the non-magnetic resonance scattering polarization profiles and compare them with the magnetic cases. We finally compare the surface averaged Stokes profiles emergent from Bifrost atmospheres with those emergent from MURaM and interpret these results.

बुधवार Wednesday 08, अक्तूबर October 2025

Venue: प्रेक्षागृह Auditorium

Time: 11:00 AM

सभी का स्वागत है All are welcome.