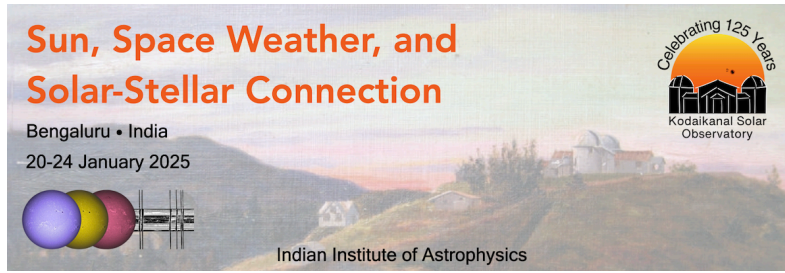


Sun, Space Weather, and Solar-Stellar Connection



Contribution ID: 139

Type: **Contributed talk**

Latitudinal Differential Rotation in Red Giants

Thursday, January 23, 2025 11:40 AM (15 minutes)

Asteroseismology is the study of oscillations in stars, which helps in understanding their interior structure and dynamics. In the last two decades, NASA's Kepler and TESS space missions have revolutionized the field of asteroseismology by providing vast datasets of photometric time series for hundreds of thousands of stars. In this talk, I will be discussing the application of asteroseismology in studying the differential rotation in stars. The envelope of a star doesn't rotate with a constant rate along the latitude. For eg., the differential rotation between the equator and poles of the Sun is 30% of the average rotation rate. Measurements of differential rotation in stars could provide insights into the mechanisms of angular momentum transport and magnetic activity in stars. Theoretical simulations have predicted the possibility of anti-solar rotation (i.e. the poles rotating faster than the equator) in stars with slower rotation rates. However, so far, there have been only a couple of reliable observations of anti-solar rotation. I will present our results of detecting significant differential rotation in several red giants, with nearly half of them showing anti-solar rotation, and the others showing solar-like rotation. We use a machine learning algorithm to infer the key seismic parameters of a star, and then we use these inferences to set the prior probability distributions for MCMC (Markov chain Monte Carlo), a standard method for fitting the oscillation spectra of stars.

Contribution Type

Theme

Solar - Stellar Connections

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