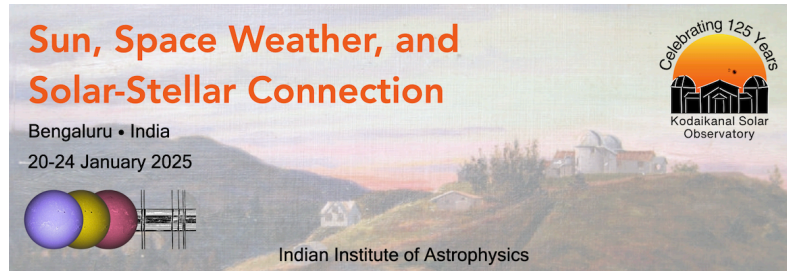


## Sun, Space Weather, and Solar-Stellar Connection



Contribution ID: 25

Type: **Contributed talk**

### 3D Radiative MHD Models of Cool Main-sequence Starspots

*Thursday, January 23, 2025 2:45 PM (15 minutes)*

Stellar variability presents a significant lower limit to detecting and characterizing exoplanets accurately. Contemporary methods of studying the impact of stellar magnetic fields (in the form of starspots and stellar faculae) involve using simple 1D model atmospheres with a specified effective temperature. We present realistic 3D MHD models of starspots with significant penumbral extent. We model a K2V and an M0V starspot, along with a reference G2V starspot. The models show considerable complexity in thermodynamic structure, velocities and field distribution. Various properties like contrast between spot and quiet star region, as well as horizontal velocities at the surface, scale with stellar type. These models represent a first step towards modelling this aspect of stellar variability more accurately.

#### Contribution Type

#### Theme

Solar - Stellar Connections

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**Session Classification:** Solar/Stellar Dynamo and Activity