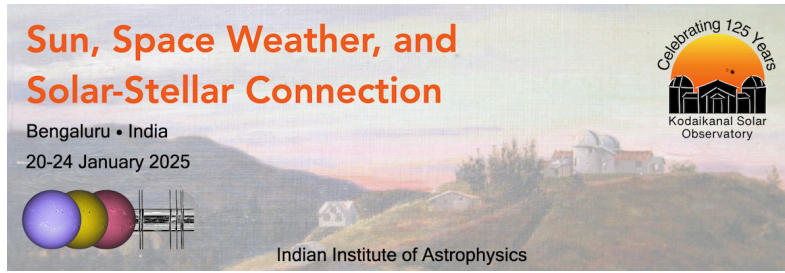


## Sun, Space Weather, and Solar-Stellar Connection



Contribution ID: 100

Type: **Contributed talk**

# Interplanetary Shocks at 1 AU: Automated Detection and Characterization Over Solar Cycles (1996–2023)

*Friday, January 24, 2025 12:15 PM (15 minutes)*

This study aims to understand the behavior and characteristics of interplanetary MHD shocks observed at 1 AU using in situ measurements spanning 1996 to 2023. We developed an automated algorithm for shock detection and analyzed the distribution and properties of various shock types, including fast forward, fast reverse, slow forward, and slow reverse shocks. Key shock parameters such as shock speed, Mach number, shock normal direction, and compression ratio were calculated, with their annual variations examined across two solar cycles. The origins of these shocks are also investigated, differentiating between those driven by coronal mass ejections (CMEs) and corotating interaction regions (CIRs). Additionally, we explored the impact of these shocks on Earth by correlating them with storm sudden commencement (SSC) events. This work offers new insights into shock physics, space weather, and their broader implications.

## Contribution Type

### Theme

Connecting Solar Corona to Heliosphere

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**Session Classification:** Extreme Events