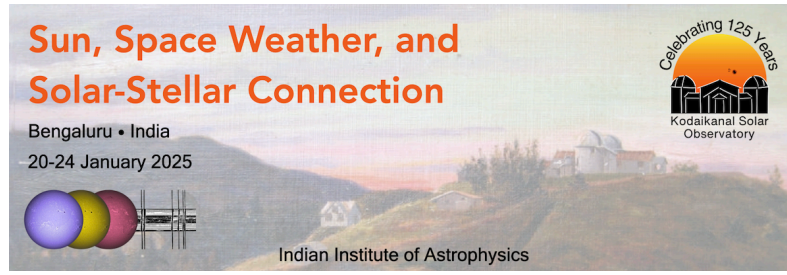


Sun, Space Weather, and Solar-Stellar Connection



Contribution ID: 59

Type: Poster

A Comprehensive Statistical Study of Sub-Alfvénic Intervals Observed at 1 AU

The solar wind typically maintains a super-Alfvénic character near 1 AU from the Sun. However, in rare cases, the solar wind density drops to the extreme, leading to a transition into a sub-Alfvénic regime. Such solar wind arriving near the Earth prevents the formation of a bow shock and magnetosheath, leading to their direct interaction with the Earth's magnetopause. In this study, we performed a comprehensive statistical analysis of sub-Alfvénic intervals observed between 1995 and 2023 using data from the 3DP and MFI instruments aboard the WIND spacecraft. We identified 11 rare sub-Alfvénic periods embedded within ICME or solar wind, each lasting more than 30 minutes. We focus on understanding the thermodynamic behavior, and turbulence of such sub-Alfvénic regions. We compare these regions' properties with those of neighboring super-Alfvénic regions. Such a study has the potential to identify the differing physical processes in the super- and sub-Alfvénic region of the solar wind.

Contribution Type

Theme

Connecting Solar Corona to Heliosphere

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