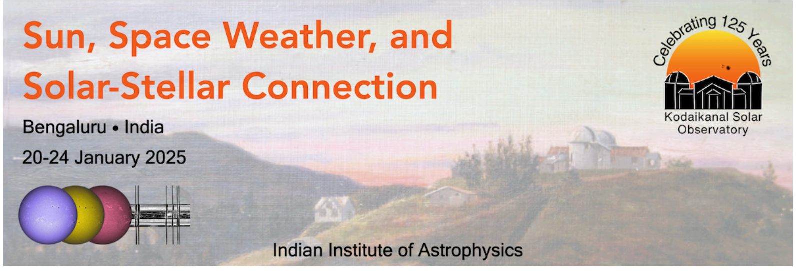

Contribution ID: **109**

Type: **Contributed talk**

The First Detailed Polarimetric Study of a Type-II Solar Radio Burst with the MWA

Friday, January 24, 2025 3:00 PM (15 minutes)

Type-II solar radio bursts are plasma emissions generated by magnetohydrodynamic shocks that are mostly associated with energetic solar eruptions such as CMEs and flares. Several studies have concluded that metric type-IIs are initiated by coronal mass ejections (CMEs). These CMEs are expected to drive shocks and are responsible for giving rise to solar energetic particles (SEPs), the biggest concern of space weather. The evolution and geo-effectiveness of these eruptions are governed by their entrained magnetic fields and interactions with the ambient magnetized plasma medium. Hence, understanding the entrained magnetic fields and the ambient medium is crucial. Polarimetric properties of metric type-IIs are promising diagnostics to understand the strength and topology of the CME-shock entrained magnetic fields and ambient plasma medium at the low-coronal heights where only a handful of direct probes are available. The majority of previous studies are based on dynamic spectra that do not provide spatially resolved information. Polarized emissions can be both positive and negative; hence, spatially integrated information may lead to incorrect measurements of polarization properties. For robust estimations of these spatio-temporally variable emissions, high-fidelity spectro-polarimetric images are essential. Instruments like the Murchison Widefield Array (MWA) and its dedicated robust solar calibration and imaging pipeline have made such studies possible. We have used this pipeline to carry out a detailed polarimetric study of a type-II solar radio burst observed with the MWA. Here we summarize the new findings from this work and discuss the potential of high-fidelity spectro-polarimetric imaging studies for understanding the shock-entrained magnetic fields and the plasma medium at the lower corona.

Contribution Type

Theme

Connecting Solar Corona to Heliosphere

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