Session 2

First detailed polarimetric study of a type II solar radio burst with the Murchison Widefield Array

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Type II solar radio bursts are well known to be predominantly associated with the more energetic and fast coronal mass ejections (CMEs). These CMEs are expected to drive shocks in the coronal medium and play a dominant role in giving rise to energetic particles which are the biggest concern for Space Weather. The type II radio bursts arise from plasma emission mechanisms and occur at fundamental and harmonic levels of the local plasma frequency. The emission at both the fundamental and harmonic is often found to be split in two sub-bands or lanes. A commonly accepted interpretation is that the electrons accelerated at the shock front moving both ahead of and behind the shock, give rise to these two lanes of emission. This suggests that these sources must lie close to each other. The vast majority of studies of type II bursts, however, rely on dynamic spectra which do not provide any spatial information. High fidelity and dynamic range solar radio images with good temporal and spectral resolution from instruments like the Murchison Widefield Array (MWA) now enable such imaging studies. Interestingly, a recent MWA imaging study of the harmonic emission from a type II burst (Bhunia et al., 2022 A&A, submitted) finds evidence that, the sources from the two lanes are not only located rather far apart in the radio images, but they are also moving in different directions and with different speeds. Making use of the recently developed spectro-polarimetric snapshot imaging pipeline (P-AIRCARS, Kansabanik et al., 2022), we have extended the study of Bhunia et al. 2022 to include polarimetric imaging and also improved upon some of the analysis procedures used by them. Here we summarize the preliminary results about the polarization properties of this type-II radio burst.