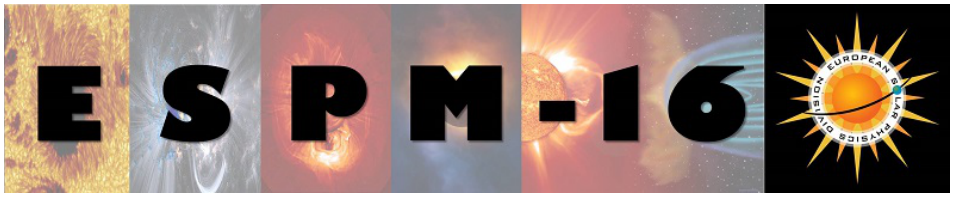

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Using high fidelity snapshot spectroscopic images to study a weak Type I solar noise storm

Wednesday 8 September 2021 15:18 (13 minutes)

We present a high fidelity snapshot spectroscopic radio imaging study of a weak type I solar noise storm which took place during an otherwise exceptionally quiet time. Using high fidelity images from the Murchison Widefield Array, we track the observed morphology of the burst source for 70 minutes and identify multiple instances where its integrated flux density and area are strongly anti-correlated with each other. The type I radio emission is believed to arise due to electron beams energized during magnetic reconnection activity. The observed anti-correlation is interpreted as evidence for presence of MHD sausage wave modes in the magnetic loops and strands along which these electron beams are propagating. Our observations suggest that the sites of these small scale reconnections are distributed along the magnetic flux tube. We hypothesise that small scale reconnections produce electron beams which quickly get collisionally damped. Hence, the plasma emission produced by them span only a narrow bandwidth and the features seen even a few MHz apart must arise from independent electron beams. These results, along with a few other works of similar nature, demonstrate the ability of spectroscopic snapshot imaging studies to detect these oscillatory phenomena. These studies have opened up a new phase space for detailed exploration of very weak/ low levels of activity.

Student poster?

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