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Multiwavelength Analysis of the 2021 October 28 X1.0 Solar Flare

Solar eruptive phenomena are often associated with a variety of radio bursts observed from metric to kilometric wavelengths. Type II and type III bursts are both generated via the plasma emission mechanism, when beams of relativistic electrons interact with ambient plasma producing radio emissions at the local plasma frequency or its first harmonic. Here, we analyze a unique multi-spacecraft observation of the 2021 October 28 event when Solar Orbiter, Parker Solar Probe, STEREO-A, and Wind detected a very intense complex radio burst associated with the X-flare. We complement space-based radio data with ground-based radio measurements. We correlated the locations and onset times of radio emissions with EUV images (SDO/AIA), and X-ray data (Solar Orbiter/STIX). We discuss how current radio observations from multiple spacecraft can be used to identify the solar origin of the electron events.

Primary author: KRUPAR, Vratislav (NASA/GSFC & GPHI/UMBC)

Co-author: MARTINEZ OLIVEROS, Juan Carlos (Space Sciences Laboratory, UC Berkeley)

Presenter: KRUPAR, Vratislav (NASA/GSFC & GPHI/UMBC)

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