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Oral
(Invited Talk)
Interplanetary coronal mass ejections (ICMEs) are the major drivers of space weather and, in particular, of geomagnetic storms. The direction of North-South component of the magnetic field in an ICME (Bz) at its collision with Earth's own magnetic field is important for predicting the strength of a corresponding geomagnetic storm. Chirality, or handedness, or a magnetic flux rope inside the ICME, together with the magnetic field configuration at its footpoints, will impact the sign of Bz for a given structure. It is therefore desirable to determine chirality in advance during the transit of an ICME through the interplanetary space.

An upcoming PUNCH mission will provide us with coronagraph data in wide field of view, and in both unpolarized (tB) and polarized (pB) white light; from the ratio of these two signals it is possible to determine the center of mass of plasma along the line of sight.

In this work, we study synthetic PUNCH observables for simulated ICMEs of varying chirality, using the open dataset 'CME Challenge 2.0', in order to document and analyze the impact that chirality makes on the observed white-light structure of ICMEs. We study synthetic in situ data for shock and magnetic cloud signatures, and analyze them together with known chirality of the synthetic events. We also compute density distributions from synthetic PUNCH polarization ratio and compare it against density distribution in the volume.
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