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Poster
The Polarimeter to UNify the Corona and Heliosphere (PUNCH) mission will explore the largely unexplored region of the heliosphere from the middle corona out to 1 AU: i.e., the "young solar wind", through direct, global, spatially continuous, and 3D deep-field imaging. This is achieved through Brightness (B) and polarized brightness (pB) measurements, which is analogous to the Stokes system in solar observing coordinates. PUNCH will be able to study the propagation of coronal mass ejections (CMEs) throughout the heliosphere, and in particular the chirality of CMEs, which can be determined directly from physics of Thomson scattering applied to synoptic polarized images.

In this presentation the Velocity And POsition Reconstruction (VAPOR) tool is presented, which is capable of using polarization measurements from PUNCH (and any analogous data sets: STEREO, LASCO, kCOR, etc) to derive the 3D structure of imaged objects in the heliosphere.

To demonstrate VAPORs capabilities both STEREO observations, and ”Clean" synthetic data generated from the Gamera model, forward modelled using the HAO FORWARD algorithm, are used to determine the position of observed and synthetic CMEs. Emphasis is given to the determination of the front-back ambiguity about the Thomson surface.

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