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Oral
(Invited Talk)
The solar wind is the extension of the Sun's hot outer atmosphere, and it is expected to undergo consistent acceleration throughout the entire field of view of PUNCH. The locations where the wind's outflow speed exceeds the phase speed of Alfvenic and fast-mode waves describe a boundary called the Alfven surface. This acts as an effective barrier beyond which most MHD fluctuations cannot propagate back down to the solar surface. In this presentation we review the properties of the Alfven surface and discuss its importance to understanding the physics of the solar wind. Both 3D simulations and recent perihelia of Parker Solar Probe have given us new information about the Alfven surface, and we will highlight how PUNCH will provide even better constraints on its properties. It is becoming increasingly apparent that this region of the heliosphere is sufficiently turbulent that there usually are multiple (stochastic and time-dependent) crossings of the Alfven surface along any radial ray. Thus, in many contexts, we now tend to think of this region as a "frothy Alfven zone" rather than an isolated radial boundary. With the help of new empirical models of density fluctuations flowing along thin flux tubes, we will also review the unique challenges of detecting downward-propagating features in PUNCH data, which will be key to locating the Alfven surface.
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