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Global inner-heliospheric magnetohydrodynamic (MHD) models aim to represent large-scale properties of the solar wind from the coronal base out to heliocentric distances of several AU, usually in a three-dimensional (3D) domain. Such models are unable to resolve the turbulent scales of the solar wind due to computational constraints, which necessitates the use of so-called Reynolds-averaged or subgrid-scale turbulence models in order to account for the crucial roles played by turbulence in solar wind dynamics. Here we present results from the latest version of our global model, which incorporates turbulence transport and heating, including the effects of Reynolds stress and eddy viscosity as well as a separate accounting of velocity and magnetic fluctuation energies. The model is validated by comparison with OMNI and Parker Solar Probe data. We discuss various approaches that can be used to generate synthetic PUNCH-like data from the model to study topics like the Alfven zone, "1/f" spectra, and the radial evolution of density fluctuations.
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PUNCH 6 Science Meeting