Abstract Submitted
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Three-Dimensional Hybrid-Kinetic Simulations of Alfvnic Turbulence in the Solar Wind[1] LEV ARZAMASSKIY, MATTHEW KUNZ, Princeton University, BENJAMIN CHANDRAN, University of New Hampshire, ELIOT QUATAERT, University of California, Berkeley — The interplanetary medium hosts a solar wind, which contains a broadband turbulent spectrum of large-amplitude Alfvén waves. In this talk, we present results from hybrid-kinetic simulations of this turbulent and essentially collisionless system. We confirm power-law indices obtained in previous analytical and numerical (e.g., gyrokinetic) studies, and carefully explore the location of the spectral break and physics occurring at the ion-Larmor scale. In the low-beta regime, we find evidence of perpendicular ion heating, which we interpret as stochastic heating arising from interactions between ions and strong fluctuations at wavelengths comparable to the ion-Larmor scale. We explore the dependence of ion heating on plasma beta. Finally, we discuss the interpretation of spacecraft measurements of this turbulence by testing the Taylor hypothesis with synthetic spacecraft measurements of our simulation data.

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