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Turbulent Heating of Heliospheric Plasmas JASON TENBARGE, GREGORY HOWES, University of Iowa — Heliospheric plasmas undergo a turbulent cascade of energy which transforms large-scale spatial energy into small-scale fluctuations, which are ultimately dissipated via kinetic mechanisms as heat. Recent high sampling rate solar wind data has extended our observational knowledge of the solar wind well into the dissipation range of the turbulence, and theoretical studies have demonstrated the dissipation range to be well modeled by a cascade of kinetic Alfvén waves. Milestone nonlinear kinetic simulations employing a realistic mass ratio and plasma $\beta = 0.01$, 0.1, 1, 10, and 100 spanning from MHD scales to the electron gyroradius are analyzed. The large dynamic range of the simulations and their kinetic nature capture both the splitting of the turbulent energy at the proton gyroradius scale into a kinetic Alfvén wave cascade and ion entropy cascade and the physical dissipation of the turbulence below the proton gyroradius. Preliminary results demonstrating scale-by-scale heating of the electron and proton populations relevant to the solar wind and corona are presented.

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