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High resolution numerical simulations of steady state imbalanced MHD turbulence JEAN C. PEREZ, UNH & UW-Madison, STANISLAV BOLDYREV, UW-Madison, JOANNE MASON, FAUSTO CATTANEO, U of Chicago — Incompressible MHD equations conserve both energy and cross helicity, which together undergo a turbulent cascade from large to small scales. In the case of nonzero cross helicity, the turbulence is called *imbalanced*. Recent solar wind observations and numerical simulations reveal that at every scale, MHD turbulence consists of regions of positive and negative cross helicity, regardless of the total amount of cross helicity in the system, indicating that MHD turbulence is inherently imbalanced. In this talk, we present results from numerical simulations performed using two different spectral codes that solve MHD and Reduced MHD equations in the steady state over hundreds of Alfvén times, massively running on tens of thousands of processor cores and reaching resolutions of up to $2048^2 \times 512$. The results from the simulations support the idea that the inertial range scaling of the energy spectra of fluctuations moving in opposite directions along to the background magnetic field is independent of the amount of cross helicity, and it is broadly consistent with phenomenological models based on dynamic alignment that predict a $k_\perp^{-3/2}$ scaling.

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