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Fluid simulations of Alfvenic turbulence at ion scales

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We present three-dimensional simulations of Alfvenic turbulence in collisionless plasmas, using a Landau fluid model that retains ion and electron Landau damping and finite Larmor radius corrections. Low frequency oblique Alfvén waves are driven at scales roughly five times larger than the ion Larmor radius, and small hyperviscosity terms are supplemented in the velocity and magnetic field equations in order to ensure the presence of a numerical dissipation range. Two runs corresponding to different amplitude levels of the magnetic field fluctuations are presented. In the small amplitude regime, the spectral properties compare well with Solar Wind observational data, with e.g. a slope close to -2.8 for the magnetic-field perpendicular spectrum. At larger amplitude, corresponding to situations actually beyond the validity range of the model, shallower spectra are obtained, suggesting that additional kinetic processes could provide in this case other channels for turbulence dissipation.