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Simulations of Decaying Kinetic Alfvén Wave Turbulence: Intermittent and Coherent Structures KURT SMITH, PAUL TERRY, UW-Madison — We simulate decaying kinetic Alfvén wave turbulence in a strong guide field, appropriate for modeling interstellar turbulence at scales $\leq 10\rho_s$. Ion flow decouples from the system at these scales, while electron density fluctuations equipartition with the magnetic field. From an initial Gaussian distribution, the system decays to a non-Gaussian PDF characterized by a large current kurtosis and positive-edge, negative-core Gaussian curvature filaments. Current filaments and their associated magnetic and density structures are long-lived, unmixed by the surrounding turbulence. The intensity of density structures does not scale with the intensity of current filaments, since the system permits a density structure to exist with a corresponding filament of either sign. Structures merge only if they correspond to like-signed current filaments. We investigate the scaling of structure radial extent with magnitude, the physics of structure mergers, and the averaged radial profile of density structures outside the core region, proposed to track the r^{-1} profile of the magnetic field.—Work supported by NSF.

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