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**Exponential Frequency Spectrum and Lorentzian Pulses in Magnetized Plasmas**

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Two completely different experiments involving pressure gradients across the confinement magnetic field in a large plasma column are found to exhibit a broadband turbulence that displays an exponential frequency spectrum for frequencies below the ion-cyclotron frequency. The origin of the exponential feature has been traced to the generation of solitary pulses having a Lorentzian temporal signature. These pulses arise from the nonlinear interaction of drift-Alfvén waves driven by the pressure gradients. The temporal width of the pulses is measured to be a fraction of a period of the initially coherent drift-Alfvén waves and sets the scaling frequency for the observed exponential spectrum. The experiments are performed in the Large Plasma Device (LAPD-U) operated by the Basic Plasma Science Facility at the University of California, Los Angeles. One experiment involves a controlled, pure electron temperature gradient associated with a microscopic (3 mm gradient length) hot-electron temperature filament created by the injection of a small electron beam embedded in the center of a large, cold magnetized plasma. The other experiment is a macroscopic (2 cm gradient length) limiter-edge experiment in which a density gradient is established by inserting a metallic plate at the edge of the nominal plasma column of the LAPD-U. The temperature filament experiment permits a detailed study of the transition from coherent to turbulent behavior and the concomitant change from classical to anomalous transport. In the limiter experiment the turbulence has been associated with blob phenomena. The similarity of the results suggest a universal feature of pressure-driven turbulence in magnetized plasmas that results in non-diffusive cross-field transport. The findings may explain previous observations in helical confinement devices, research tokamaks and arc-plasmas.