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Model for avalanches in a hollow pressure filament[1] M. J. POULOS, G. J. MORALES, University of California, Los Angeles — A theoretical and modeling study is made of a novel heating configuration recently implemented in the LAPD device at UCLA [1]. The geometry essentially consists of a hollow pressure filament embedded in a cold, magnetized plasma. An eigenmode-based stability analysis is made of drift-waves excited by simultaneous gradients in density and temperature. A Braginskii transport code that includes the ExB flows of the unstable modes is used to self-consistently evolve the profile modifications in the presence of external heating. A shooting code is used to calculate the evolving mode structures as the profiles are modified. It is found that intermittent avalanches are triggered and their properties are in good agreement with the experimental observations. During the recovery phase after an avalanche the large difference between the relaxation times of density and temperature results in azimuthal filamentation of the profiles. New insights are obtained that suggest future laboratory and theoretical studies. [1] B. Van Compernolle, G. J. Morales, J. E. Maggs , and R. D. Sydora, Phys. Rev. E 91, 031102 (2015).

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