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Transition from avalanche dominated transport to drift-wave dominated transport in a basic laboratory experiment[1] BART VAN COMPERNOLLE, GEORGE MORALES, JAMES MAGGS, University of California, Los Angeles, RICHARD SYDORA, University of Alberta, Canada — Results of a basic heat transport experiment involving an off-axis heat source are presented. Experiments are performed in the Large Plasma Device (LAPD) at UCLA. A ring-shaped electron beam source injects low energy electrons (below ionization energy) along a strong magnetic field into a preexisting, large and cold plasma. The injected electrons are thermalized by Coulomb collisions within a short distance and provide an off-axis heat source that results in a long, hollow, cylindrical region of elevated plasma pressure embedded in a colder plasma, and far from the machine walls. The off-axis source is active for a period long compared to the density decay time, i.e. as time progresses the power per particle increases. Two distinct regimes are observed to take place, an initial regime dominated by avalanches, identified as sudden intermittent rearrangements of the pressure profile, and a second regime dominated by sustained drift-Alfvén wave activity. The transition between the two regimes is sudden, affects the full radial profile and is preceded by the growth of drift Alfvén waves. Langmuir probe data will be shown on the evolution of the density, temperature and flow profiles during the transition. The character of the sustained drift wave activity will also be presented.

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Bart Van Compernolle
University of California, Los Angeles

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