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Transport bursts in simulations of tokamak edge turbulence[1]
ROBERT KLEVA, PARVEZ GUZDAR, IREAP, University of Maryland, College Park, MD — The character of particle and energy transport in simulations of tokamak edge turbulence is determined by the magnitude of the density gradient. Edge turbulence becomes increasingly intermittent as the edge density gradient increases. Beyond a critical limit in the edge density gradient, the transport is dominated by short, repetitive bursts of particles and energy outward toward the wall. These bursts are extremely ballooning in character, strongly localized on the large major radius side of the torus. The duration of a burst is of the order of the ballooning growth time $t_0 = (RL_n)^{1/2}/c_s$, where c_s is the sound speed, R is the major radius of the torus, and L_n is the density gradient scale length. With further increases in the edge density gradient, the fluxes of energy and particles in the bursts become larger in magnitude. The particle and energy bursts seen in the simulations are similar to the bursts in D_α radiationseen during edge- localized modes (ELM's) in tokamaks.

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