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L-I-H Transition with Avalanche Noise C.J. LEE, UCSD, P.H. DIAMOND, UCSD and NFRI, Korea, K. MIKI, NFRI, Korea — Discharges have been observed to persist in a state subcritical to the H-mode, called I-phase, for extended periods. L-H transitions occur spontaneously in this state. I-phase edges are excited by noise, due to the statistical variability of core heat avalanches arriving at the edge. This suggests that the L-H transition problem should be formulated statistically, given an ensemble of colored noise tied to the mean heat flux. In this paper, we study the L-H transition in the presence of a noisy mean heat flux using 0D multi-field models, with special attention on the marginally subcritical state. The transition problem is formulated of the "waiting time" variety, studied as a function of margin below mean threshold, noise spectrum, and noise strength. Results indicate that 1/f noise, as expected for avalanche-induced flux perturbations, is more effective at triggering transitions. Our analyses of crossing rates and the effects of temporal coherence extend beyond a related analysis by Bian (PoP 2010). The effects of noise characteristics on reverse H-L transition dynamics is also investigated and related 1D modeling will be discussed.

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