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Switching exponent scaling near bifurcation points for non-Gaussian noise MARK DYKMAN, Michigan State University, L. BILLINGS, M. MCCRARY, Montclair State University, A.N. KOROTKOV, UC Riverside, I.B. SCHWARTZ, US Naval Research Laboratory — We study noise-induced switching of a system close to bifurcation parameter values where the number of stable states changes, the phenomenon that underlies the operation of bifurcation amplifiers. For non-Gaussian noise, the switching exponent Q, which gives the logarithm of the switching rate, displays a non-power-law dependence on the distance to the bifurcation point in the parameter space. For Poisson noise, Q is proportional to the square root of this distance and contains a large distance-dependent logarithmic factor that has also a characteristic dependence on the area and mean frequency of the noise pulses. Even weak additional Gaussian noise dominates switching sufficiently close to the bifurcation point, leading to a crossover in the behavior of the switching exponent to the familiar power-law scaling. Explicit results are obtained for the saddle-node and pitchfork bifurcations and are compared with numerical simulations.

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