

INTERNAL NOISE INTERFERENCE TO WARNINGS OF TIPPING POINTS IN GENERIC MULTI-DIMENSIONAL DYNAMICAL SYSTEMS

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A deterministic dynamical system that slowly passes through a generic fold-type (saddle-node) bifurcation can be reduced to one-dimensional dynamics close to the bifurcation because of the centre manifold theorem. It is often tacitly assumed that the same is true in the presence of stochasticity or noise so that, for example, critical slowing down (CSD) indicators can be applied as if the system were one-dimensional. In this talk, I will show that this is only true when given suitable system observables; specifically, I will demonstrate that noise in other dimensions may interfere with indicators of CSD, also referred to as early warning signals (EWS). By this mechanism, both variance and lag-1 autocorrelation [$AC(1)$], as well as other EWS, can fail to signal an approaching bifurcation.