

Abstract Submitted
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Constructing almost invariant sets for multi-stable systems¹

LORA BILLINGS, Montclair State University, IRA SCHWARTZ, Naval Research Laboratory, Washington, DC — We consider the problem of noise driven dynamical systems possessing deterministic multiple stable invariant sets. Noise typically creates a single attractor by mixing the underlying deterministic basins of attraction. We show how to approximate the distributions of the almost invariant stochastic attractors probabilistically. We employ the tools from stochastic Markov operator theory to describe the dynamical evolution. Given a stochastic kernel with a known distribution, we approximate the almost invariant sets by translating the problem into a spectral problem. We illustrate the method on a model from epidemiology in a large population. This method distinguishes two almost invariant sets, having large and small outbreaks.

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