Transient Dynamical Indicators of Critical Transitions

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Abstract

Replace the text here with your abstract.

Keywords: tipping point, critical transition, critical slowing down, early warning signals, resilience, intensity of attraction

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1.1 Critical Transitions

A tipping point or critical transition occurs in a dynamical system when a small perturbation to the system causes an abrupt qualitative shift in overall behavior. This informal concept is often understood as a local bifurcation, but may also correspond to a variety of other dynamical behaviors including global bifurcations, perturbations pushing a state variable across the boundary between two basins of attraction, and rate-induced tipping.

Empirically, critical transitions have been studied in contexts ranging from Earth's climate [2] to emerging infectious disease [1] to

In complex empirical systems, the conditions under which a critical transition occurs are generally extremely difficult to predict. In many cases, the underlying mechanisms driving such a system toward the brink may be impossible to fully understand or identify.

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[?]

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References

[1] Tobias S. Brett and Pejman Rohani. Dynamical footprints enable detection of disease emergence. *PLOS Biology*, 18(5):e3000697, May 2020. ISSN 1545-7885. doi:10.1371/journal.pbio.3000697.

[2] Timothy M. Lenton. Early warning of climate tipping points. *Nature Climate Change*, 1(4):201–209, July 2011. ISSN 1758-6798. doi:10.1038/nclimate1143.