

Abstract Submitted
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Complexity facilitates perturbation of a coherent dynamical process MALGORZATA TURALSKA, University of North Texas, ELVIS GENESTON, La Sierra University, PAOLO GRIGOLINI, University of North Texas — We discuss the influence of perturbation on networks of globally coupled three state stochastic oscillators. When coupled, the system shows intermittent behavior characterized by a waiting time distribution which reveals both inverse power-law and coherent dynamical properties. Specifically, we compare the results of perturbation realized with a periodic signal to those obtained using perturbation provided by a matching system. We find that the SNR (signal-to-noise ratio) does not depend on the frequency of the perturbing signal. We also observe that the second approach results in higher values of SNR. We discuss how those findings cannot be explained by either classical or statistical resonance theory. With the help of the fluctuation-dissipation theorem [1] we determine the role of the scaling dynamics in the system under investigation.

[1] Aquino G., Bologna M., Grigolioni P., West B.J., PRL 105, 040601 (2010)

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