

Critical behavior of noise-induced phase synchronization

We present for the first time in detail the set of the main critical exponents associated with the phase transition of the Kuramoto model under multiplicative noise action. This was done considering the equilibrium thermodynamics for the states of synchronization [1], as well as the subsequent analysis of the critical behavior of the free energy and entropy of the model. We reinforce the concept of the synchronization field for a system of oscillators with multiplicative noise where an expression for the susceptibility is analytically obtained at the critical limit. These results complete the gap that was lacking in obtaining all the critical exponents associated with the phase transition of a Kuramoto-type model.

[1] PD Pinto, FA Oliveira, ALA Penna, Phys. Rev. E 93 052220 (2016).

[2] PD Pinto, ALA Penna, FA Oliveira, EPL 117 5 50009 (2017).

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