



Contribution ID: 6

Type: **not specified**

Kuramoto model of synchronization: equilibrium and nonequilibrium aspects

Thursday, 10 December 2015 16:00 (30 minutes)

Recently, there has been considerable interest in the study of spontaneous synchronization, particularly within the framework of the Kuramoto model. The model comprises oscillators with distributed natural frequencies interacting through a mean-field coupling, and serves as a paradigm to study synchronization. In this talk, I will describe the model from a different point of view, emphasizing the equilibrium and nonequilibrium aspects of its dynamics from a statistical physics perspective. I will discuss in a unified way known results with more recent developments obtained for a generalized Kuramoto model that includes inertial effects and noise.

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Session Classification: Session 5