Seminario del Instituto Gregorio Millán

A spectral theory of linear operators on a Gelfand triplet and its application to dynamics of coupled oscillators

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Abstract

The Kuramoto model is a system of ordinary differential equations for describing synchronization phenomena defined as a coupled phase oscillators. In this talk, an infinite dimensional Kuramoto model is considered, and Kuramoto's conjecture on a bifurcation diagram of the system will be proved.

A linear operator obtained from the linearization of the Kuramoto model has the continuous spectrum on the imaginary axis, so that the usual spectrum theory does not determine the dynamics of the system. To handle such continuous spectra, a new spectral theory of linear operators based on Gelfand triplets is developed. In particular, a generalized eigenvalue is defined. It is proved that a generalized eigenvalue determines the stability and bifurcation of the system.

Día y hora: Miércoles, 25 de junio de 2014 a las 12:00
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