



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 13 November 2014

17:00 -18:00

3rd Floor Seminar Room

“Synchronization of Large Linear Oscillator Arrays”

Prof. J.J.P. Veerman

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Abstract

Synchronization of a large collection of coupled, simple dynamical systems is a problem that has applications from neuroscience to traffic modeling to modeling of consensus formation. Consider an array of identical linear oscillators, each coupled to its front and rear neighbor. The coupling may be asymmetric. If we kick the front oscillator (the leader), how does this signal propagate through the system? In some isolated cases, for certain values of the parameters, the answer is well-known, but until recently the only general results applicable to large systems were very qualitative. We developed a theory that gives the correct quantitative description. The theory uses ideas from partial differential equations, but without taking a continuum limit. We will describe the theory and the conjectures it is based upon, as well as the quantitative results.