Ciências ULisboa

SEMINÁRIO

SISTEMAS DINÂMICOS

5 de Agosto | 14h30 | sala 6.2.33

Finite time dynamics and predictions for strongly chaotic dynamical and stochastic systems

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Abstract:

Traditionally the dynamical systems theory deals with asymptotic in time properties like ergodic theorems, mixing (decay of correlations), etc, unless solutions are known and thus could be computed for any moment of time. Analogously probability theory deals with limit, i.e. again asymptotic in time, theorems, like e.g. Central Limit Theorem, large deviations, etc. Moreover, all basic notions we use like Lyapunov exponents, entropies, various types of mixing, etc involve taking a limit when time tends to infinity or integration over an infinite time interval. I will demonstrate that some interesting finite time properties of "the most chaotic" dynamical systems and of "the most random" stochastic processes can be rigorously studied. In fact, it is possible to say what "more likely" is going to happen already at the next moment of time. Numerical simulations show that similar types of predictions can be made for systems of chaotic and random systems of a general type.

CMAFcIO

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