O Caos e o Acaso

Encontro CIM-SPM-SPE com o apoio do CMUP
Porto, 4 de Março de 2011
Sala 0.07 do Departamento de Matemática da FCUP
(Entrada livre)

Programa:

14.00-14.45 **José Ferreira Alves** (Universidade do Porto)

Mixing rates and recurrence times

Abstract: A classic approach in dynamical systems is to use particular geometric structures to deduce statistical properties, for example the existence of invariant measures with stochastic-like behaviour such as large deviations or decay of correlations. Such geometric structures are generally highly non-trivial and thus a natural question is the extent to which this approach can be applied. We show that in many cases stochastic-like behaviour itself implies that the system has certain non-trivial geometric properties, which are therefore necessary as well as sufficient conditions for the occurrence of the statistical properties under consideration.

14.45-15.30 **Tomás Caraballo** (Universidad de Sevilla)

Stabilizing effects of noise on dynamical systems

Abstract: The aim of this talk is to present some features concerning the effects of noise on the asymptotic behaviour of dynamical systems. It is well-known now the stabilizing and destabilizing effects which the appearance of different kinds of noise (e.g. Ito or Stratonovich) may have on the stationary solutions (equilibria) of deterministic dynamical systems. Now we will report some results on the appearance of exponentially stable stationary (in the stochastic sense) solutions when some noise is added to the model, as well as, the analysis of the existence of random attractor when the deterministic model is not known to have (or does not have) a global attractor. These results will show some kind of stabilization on global attractors instead of only on equilibria.

15.30-16.00 Coffee break

16.00-16.45 **Ana Bela Cruzeiro** (Universidade Técnica de Lisboa)

Stochastic Lagrangian Navier-Stokes flows

Abstract: We associate to Navier-Stokes equations stochastic flows that model the evolution of the particles position. We describe some of their properties.

16.45-17.30 **Kamil Feridun Turkman** (Universidade de Lisboa)

Why non-linear processes generate chaotic sample paths

Abstract: Linear time series models have been the most important tool in modeling serially correlated data sets. However, Linear models have certain restrictions which limit their use particularly for environmental and financial data sets and as a consequence, we resort using non-linear models as alternatives. One of the main consequences of non-linearity is sample paths having clusters of large values. Non-linear processes tend to produce more extreme values as compared to linear models even with moderately tailed inputs. In this talk, we will stress on some of the general characteristics of non-linear processes such as dependence on initial conditions, limit cycles and extremal values to explain why nonlinear processes tend to produce chaotic sample paths as compared to linear processes.

17.30-18-30 Debate

Moderadores:

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