Asymptotic behaviour of non-autonomous systems

María Anguiano
Dpto. Ecuaciones Diferenciales y Análisis Numérico, Universidad de Sevilla, Spain
anguiano@us.es

When a phenomenon from Physics, Chemistry, Biology, Economics can be described by a system of equations where the existence of solution can be assured, one of the most interesting problems is to know what is the asymptotic behaviour of the system when time grows to infinity. The study of the asymptotic behaviour of the system is giving us relevant information about the future of the phenomenon described in the model. In this context, the concept of global attractor has become a very useful tool to describe the long-time behaviour of many important dynamical systems.

The global attractor is an object that captures the asymptotic behaviour of autonomous systems. The aim of this talk is to introduce the *pullback attractor*, which seems to be the correct generalisation of this concept for use with non-autonomous processes (see for instance [3] and [4]).

I will recall some abstract results on the theory of pullback attractors and I will show recent results about the existence of pullback attractors for several non-autonomous models (see [1] and [2]).

References

[1] *M. Anguiano*: Atractores para EDP parabólicas no lineales y no autónomas en dominios no acotados (Attractors for nonlinear and non-autonomous parabolic PDEs in unbounded domains), Ph.D. Thesis, Universidad de Sevilla, 2011.

[2] *M. Anguiano, T. Caraballo*: Asymptotic behaviour of a non-autonomous Lorenz-84 system. To appear in Discrete and Continuous Dynamical Systems, Series A.

[3] *A. N. Carvalho, J. A. Langa, J. C. Robinson*: Attractors for infinite-dimensional non-autonomous dynamical systems. Applied Mathematical Sciences, 182, Springer, New York, 2013.

[4] *P. E. Kloeden, M. Rasmussen*: Nonautonomous dynamical systems. Mathematical Surveys and Monographs, 176, American Mathematical Society, Province, RI, 2011.