



Mês de: **Novembro 2006**

SEMINÁRIOS DE ANÁLISE

Dia 16 de Novembro (quinta-feira), às 14^h15^m, na Sala B3-01

Dynamics of a nonautonomous ODE system occurring in coagulation
theory

Fernando Pestana da Costa
(Universidade Aberta)

Abstract:

We consider the following coagulation equation with Becker-Döring type interactions and power law input of monomers $J_1(t) = \alpha t^\omega$, with $\alpha > 0$ and $\omega > -\frac{1}{2}$

$$\begin{cases} \dot{c}_1 = J_1(t) - c_1^2 - c_1 \sum_{j=1}^{\infty} c_j \\ \dot{c}_j = c_1 c_{j-1} - c_1 c_j, \quad j \geq 2, \end{cases}$$

For this infinite dimensional system we prove solutions converge to known similarity profiles as t and j converge to infinity in a similarity way, namely with either j/ζ or $(j - \zeta)/\sqrt{\zeta}$ constants, where $\zeta = \zeta(t)$ is a function of t only. The main part of the approach is the analysis of a bidimensional non-autonomous system obtained through an appropriate change of variables; this is achieved by the use of differential inequalities and qualitative theory methods. The results about rate of convergence of solutions of the bidimensional system thus obtained are fed into an integral formula representation for the solutions of the infinite dimensional system whose behaviour can then be controlled in order to obtain the convergence to the similarity profiles.

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Local:
COMPLEXO INTERDISCIPLINAR
Av. Prof. Gama Pinto, 2
1649-003 Lisboa

