HACETTEPE ÜNİVERSİTESİMATEMATİK BÖLÜMÜ

GENEL SEMİNERİ

(HACETTEPE MATHEMATICS GENERAL SEMINAR)

Tarih : 30 Ekim 2014, Perşembe

Saat : 14:00

Yer: Yaşar ATAMAN Seminer Salonu

Konuşmacı: Doç. Dr. Süleyman Ulusoy (Zirve Üniversitesi)

Başlık : Global Attractors for Quasilinear Parabolic-Hyperbolic Equations Governing Longitudinal Motions of Nonlinearly Viscoelastic Rods

Özet : We prove the existence of a global attractor and estimate its dimension for a general family of third-order quasilinear parabolic-hyperbolic equations governing the longitudinal motion of nonlinearly viscoelastic rods carrying an end mass and subject to interesting body forces. The simplest version of the equations has the form $w_{tt} = n(w_x,w_{xt})_x$ where n is defined on $(0,\infty) \times \bbR$ and is a strictly increasing function of each of its arguments, with $n \to -\infty$ as its first argument goes to 0. This limit characterizes a total compression, a source of technical difficulty, which new delicate a priori estimates prevent. We determine how the dimension of the attractor varies with the ratio of the mass of the rod to that of the end mass, giving conditions ensuring that the dimension is small.

The estimates of dimension illuminate asymptotic analyses of the governing equations as this mass ratio goes to 0.