

Koç University, Mathematics Seminar

Date & Time: Thursday, October 23, 17:30-18:30

Place: SCI-103

Speaker: Süleyman Ulusoy (Zirve University)

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

Abstract: 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 $(0, \infty) \times \mathbb{R}$ and is a strictly increasing function of each of its arguments, with $n \rightarrow -\infty$ 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.

This is a joint work with Stuart S. Antman and it has been supported by TUBITAK grant 112T237.

About the Speaker: S. Ulusoy received BS degrees in Mathematics and Mathematics Education from METU in 2000. He received MS and PhD degrees from Georgia Institute of Technology in 2005 and 2007 respectively. He worked as a postdoctoral research associate in University of Oslo and University of Maryland. He is currently working as an Associate professor at Zirve University. For further info please visit