Analysis Seminar

"Viscoelasticity with limited strain: traveling waves and the Cauchy problem"

By

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Abstract: We are interested in finding solutions of nonlinear differential equations describing the behaviour of one-dimensional viscoelastic medium with implicit constitutive relations. We focus on a subclass of such models known as the strain-limiting models introduced by Rajagopal. To describe the response of viscoelastic solids we assume a nonlinear relationship among the linearized strain, the strain rate and the Cauchy stress. We first look at traveling wave solutions that correspond to the heteroclinic connections between the two constant states, and establish conditions for the existence of such solutions, and find them explicitly, implicitly or numerically, for various forms of the non-linear constitutive relation. Then we consider the corresponding Cauchy problem for the stress variable and under the invertibility assumption on the nonlinear constitutive function, we convert the problem to a new form for the strain variable and prove local well-posedness.

Date: Tuesday, April 30, 2019

Time: 16:40-17:40

Place: Mathematics Seminar Room, SA – 141

Tea and cookies will be served before the seminar.