

On the stability of a wave equation with localized viscoelastic dampings

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In this talk, we consider a transmission problem for a string composed of different types of components: an elastic material (without dissipation) and two different kinds of viscoelastic materials. The viscoelastic material of memory type and the Kelvin-Voigt viscoelastic material can act simultaneously or complementary on the string. We discuss how the decay rate depends on the position of the components, and particularly on whether at least one part of the elastic part of the string connects with the Kelvin-Voigt material but not with the memory part. We show when exponential stability is possible and, when only polynomial stability is attained, we obtain optimal decay rates, using the spectral characterization of the asymptotic stability of the solutions.

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