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Stabilization of a coupled wave equations with one localized non-regular fractional Kelvin-Voigt damping with non-smooth coefficients

Li Zhang[1], Wenjun Liu[1], Yanning An[1], and Xinxin Cao[1]

[1]Nanjing University of Information Science and Technology

March 25, 2022

Abstract

In this paper, we study the stabilization of a coupled wave system formed by one localized non-regular fractional viscoelastic damping of Kelvin-Voigt type and localized non-smooth coefficients. Our main aim is to prove that the C0-semigroup associated with this model is strong stability and decays polynomially at a rate of t-1. By introducing a new system to deal with fractional Kelvin-Voigt damping, we obtain a new equivalent augmented system, so as to show the well-posedness of the system based on Lumer-Phillips theorem. We achieve the strong stability for the C0-semigroup associated with this new model by using a general criteria of Arendt-Batty, and then turn out a polynomial energy decay rate of order t-1 with the help of a frequency domain approach.

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