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Decay Solutions of Biharmonic Schrödinger Equation with Internal Fractional Damping

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Abstract

In this work we study the problem of biharmonic Schrödinger equation with an internal fractional damping of order ϖ, $0 < \varpi < 1$. First, we establish the existence of the solutions through the theory of semigroup. Further, by spectrum approach combined with a general criteria of Arendt-Batty, we prove that our model is strongly stable. Then, we establish a polynomial energy decay estimate of type $t^{(\varpi-1)/2}$ using the frequency domain approach from semigroup theory. Finally, we show that our system lacks exponential (uniform) stability.

keywords : Biharmonic Schrödinger equation, internal fractional damping, semigroup theory, polynomial stability.

Mathematics Subject Classification : 35B40, 35Q41, 93D15.

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