

Qualitative Analysis of Coupled Biharmonic Schrödinger Equations with Internal Fractional Damping

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Abstract

This work deals with the stabilization of coupled biharmonic Schrödinger equations with internal fractional damping. First, the well-posedness of the system is established using the semigroup theory of linear operators. Then, the strong stability of the associated semigroup is proved through suitable energy estimates and spectral analysis. Finally, by combining multiplier techniques with the frequency domain method, a polynomial decay rate for the system energy is obtained. These results illustrate the dissipative effect of the fractional damping on the long-time behavior of solutions.

Mathematics Subject Classification : 35B40, 35Q41, 93D20.

Keywords and phrases: Biharmonic Schrödinger equation, Internal fractional damping, Semigroup theory.

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