Equipartition of energy for nonautonomous wave equations

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ABSTRACT

Consider wave equations of the form

$$u''(t) + Bu'(t) + Au(t) = 0$$

where A, B are nonnegative commutiong selfadjoint operators on a Hilbert space with A injective. Energy is conserved when $B = 0$; otherwise energy decays. Asymptotic equipartition of energy (in the sense that the ratio of the kinetic to potential energy tends to1as t$\rightarrow \infty$ for all nonzero finite energy solutions) has been a topic of interest since the 1960s. But no such results had been established for the corresponding nonautonomous equations, problems where A, B depend on t and the equation reduces to the displayed equation above when the $t-$dependence is not present. We present the first results of this nature. This is joint work with Gisele Goldstein (Memphis) and Fabiana Travessini de Cezaro (Rio Grande).