

Wave Equations with Time-Dependent Spatial Operators of Higher Order

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Abstract. We study the initial-boundary value problem for $\partial_t^2 u(t, x) + A(t)u(t, x) + B(t)\partial_t u(t, x) = f(t, x)$ on $[0, T] \times \Omega$ ($\Omega \subset \mathbb{R}^n$) with homogeneous Dirichlet boundary condition; here $A(t)$ denotes a family of uniformly strongly elliptic operators of order $2m$, $B(t)$ denotes a family of spatial differential operators of order $\leq m$, and u is a scalar function. We prove the existence of a unique strong solution u . Furthermore an energy estimate for u is given.

Keywords: Linear wave equation, Energy estimate

AMS classification 35L05, 35L30, 35L35, 35G15

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