Energy Decay of Solutions of Semilinear Plate Equation on Unbounded Domain

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Abstract. In this work, we give positive answer to the open question raised in [E. Zuazua, Exponential decay for the semilinear wave equation with localized damping in unbounded domains. J. Maths. Pures Appl., 70 (1991) 513-529] on the exponential decay of solutions for the semilinear plate equation

$$u_{tt} + \Delta^2 u + a(x)u_t + \alpha u + f(u) = 0$$

with localized damping. Exponential decay of the energy for this problem means that for the weak solution of this problem there exist some constants $C>1$ and $\gamma > 0$ such that $E(t) \leq CE(0)e^{-\gamma t}$ where $E(t)$ is the energy functional.

Keywords. Plate Equation, Energy Decay, Local Dissipativity, Weak Solution.

AMS 2010. 35B40, 35L30, 74H40

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