Asymptotic profile of solutions for wave equations with very strong structural damping and related topics

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In this talk, we will consider the Cauchy problem of the following wave equation with a structural damping:

$$u_{tt}(t,x) - \Delta u(t,x) + \Delta^2 u_t(t,x) = 0, \quad (t,x) \in (0,\infty) \times \mathbf{R}^n, \tag{1}$$

$$u(0,x) = u_0(x), \quad u_t(0,x) = u_1(x), \quad x \in \mathbf{R}^n. \tag{2}$$

We will report our recent results concerning the asymptotic profile (as $t \to \infty$) of solutions to (1)-(2), and as an application we will derive several optimal estimates of the solutions in L^2-framework. A main tool to find such asymptotic profile, we rely on a new method introduced by the speaker (JDE, 257, 2014, 2159-2177). My talk is based on a joint work with Shin Iyota (Hiroshima Univ.) which has been recently published from MMAS, 41, 2018, 5074-5090.