ON SOME NONLINEAR VIBRATION EQUATIONS

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Study of the existence, regularity and uniqueness of weak solutions to the mixed problem for $\epsilon \to 0_+$

$$u_{tt} + m(\|\nabla u\|^2 + \epsilon\|u\|^2)(-\Delta u + \epsilon u) + |u|^\alpha u = f, \quad x \in \Omega, \quad 0 < t < T,$$

$$\frac{\partial u}{\partial n} = 0, \quad x \in \partial\Omega, \quad 0 \leq t \leq T,$$

$$u(x,0) = g(x), \quad u_t(x,0) = h(x), \quad x \in \Omega,$$

where Ω is a bounded domain with smooth boundary $\partial\Omega$, $m(r)$ is a positive C^1-function on $[0,\infty)$, $\alpha \geq 0$ and $T > 0$ are given constants.

Asymptotic behavior of solutions to the damped, nonlinear vibration equation

$$u_{tt} + \gamma u_t - m(\|\nabla u\|^2)\Delta u + |u|^\alpha u = f,$$

where $\gamma > 0$ is a given constant. Degenerate and non-degenerate case, extension of results to equations with Δ^2.