LONG TIME BEHAVIOR OF A QUASILINEAR HYPERBOLIC SYSTEM MODELLING ELASTIC MEMBRANES

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We will study the long time behavior of a system that describes the motion of a piece of elastic membrane driven by surface tension and inner air pressure. The system is a degenerate quasilinear hyperbolic one that involves the mean curvature, and also includes a damping term that models the dissipative nature of genuine physical systems. With the presence of damping, a small perturbation of the sphere converges exponentially in time to the sphere, and without the damping the evolution that is ε-close to the sphere has life span longer than $\varepsilon^{-1/6}$. Both results are proved using an improved Nash-Moser-Hörmander theorem. The paper is posted on Arxiv: `https://arxiv.org/abs/2010.10663`.

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