

The global existence of small data solutions of certain viscoelastic evolution problems

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Abstract. We establish some new results concerning the initial value problem first order on the whole space \mathbb{R}^n ($n \geq 1$), the decay structure of which is of regularity-loss property. By using Fourier transform and Laplace transform, we obtain the fundamental solutions and thus the solution to the corresponding linear problem. Appealing to the point-wise estimate in the Fourier space of solutions to the linear problem, we get estimates and properties of solution operator, by exploiting which decay estimates of solutions to the linear problem are obtained. Also by introducing a set of time-weighted Sobolev spaces and using the contraction mapping theorem, we obtain the global in-time existence and the optimal decay estimates of solutions to the semi-linear problem under smallness assumption on the initial data.