

Unconditional global well-posedness for a nonlinear damped beam equation with decay property of the solution.

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Abstract In this talk, we consider a nonlinear beam equation with the weak damping term. Our aim is to show that the unconditional global well-posedness for the small data and obtain the decay estimates of the solution in the same framework. Our method is based on the linear estimates in the weighted Sobolev space. In the linear estimates, we can observe not only the dissipative structure but also the regularity loss properties for the weighted estimates of the linearized solution. On the other hand, using the smoothing effects from the higher order term, we can prevent the extra regularity loss from the nonlinear interaction. We also show the large data blow up results, which implies that the smallness of the data is important for our situation.

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