# Long-time behavior of quasilinear thermoelastic Kirchhoff–Love plates with second sound

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**Abstract**

We consider an initial–boundary-value problem for a thermoelastic Kirchhoff & Love plate, thermally insulated and simply supported on the boundary, incorporating rotational inertia and a quasilinear hypoelastic response, while the heat effects are modeled using the hyperbolic Maxwell–Cattaneo–Vernotte law giving rise to a 'second sound' effect. We study the local well-posedness of the resulting quasilinear mixed-order hyperbolic system in a suitable solution class of smooth functions mapping into Sobolev $H^k$-spaces. Exploiting the sole source of energy dissipation entering the system through the hyperbolic heat flux moment, provided the initial data are small – not in the full topology of our solution class, but in a lower topology corresponding to weak solutions –, we prove a nonlinear stabilizability estimate furnishing global existence & uniqueness and exponential decay of classical solutions.

This is joint work with Irena Lasiecka (University of Memphis, TN, USA) and Xiang Wan (Wayne State University, Detroit, MI, USA).