Well-Posedness for Damped Hyperbolic Equation with Critical Hartree Type Nonlinearity

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Abstract:

In this talk, I will present the study on the well-posedness of the initial boundary value problem for the damped hyperbolic equation with strong damping, weak damping and Hartree type nonlinearity with Hardy-Littlewood-Sobolev critical exponent. First, we establish the local existence by the Galerkin method and Banach fixed point theorem. Overcoming the challenge from the damping structure of the equation, the nonlocal characteristic of the Hartree type nonlinearity and the lack of compactness caused by the critical exponent, we construct the corresponding potential well theory and obtain the global existence and finite time blowup of solutions at the subcritical and critical initial energy levels, and the finite time blowup of the global solution and estimate the blowup time of the blowup solution. Finally, we investigate the continuous dependence of the global solution on the initial data and the coefficients of strong damping and weak damping.