

Asymptotic behavior of solutions to quasilinear wave equations with dissipative structure

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In this talk we consider the initial value problem for quasilinear wave equations in two space dimension. In this case, the critical exponent for global solvability for smooth initial data is 3, and if the nonlinearity on the critical level satisfies the so-called null structure, then the problem still admits a global solution for small initial data. Moreover, it is known that even in the subcritical case the null structure leads to a global solvability for small initial data. Here we prove that if the quadratic part of the nonlinearity satisfies the null condition and if the cubic part of it possesses the “dissipative structure” which includes the null structure, then we can solve the problem globally in time for small initial data. The proof is based on the method of characteristic for quasilinear equations, and does not rely on the Lorentz boosts and space-time scaling operator.