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Diffusion Waves for Hyperbolic p -System with Nonlinear Damping

This talk is concerned with the p -system of hyperbolic conservation laws with nonlinear damping. We show that the solutions of the Cauchy problem for the p -system converge to their corresponding nonlinear diffusion waves, which are the solutions of the corresponding nonlinear parabolic equation given by the Darcy's law. The optimal convergence rates are also obtained. In order to overcome the difficulty caused by the nonlinear damping, a couple of correction functions have been technically constructed. The approach adopted is the elementary energy and Fourier transform.