1038-35-334   **Tong Li*** (`tli@math.uiowa.edu`), Department of Mathematics, University of Iowa, Iowa City, IA 52242. *Stability of traveling waves in quasi-linear hyperbolic systems with relaxation and diffusion.* Preliminary report.

We establish the existence and the stability of traveling wave solutions of a quasi-linear hyperbolic system with both relaxation and diffusion. The traveling wave solutions are shown to be asymptotically stable under small disturbances and under the sub-characteristic condition using a weighted energy method. The delicate balance between the relaxation and the diffusion that leads to the stability of the traveling waves is identified, namely, the diffusion coefficient is bounded by a constant multiple of the relaxation time. Such a result provides an important first step toward the understanding of the transition from stability to instability as parameters vary in physical problems involving both relaxation and diffusion. (Received February 12, 2008)