

Vanishing Viscosity Approximations to Systems of Conservation Laws

Alberto Bressan
International School for Advanced Studies (S.I.S.S.A.)
Via Beirut 4, Trieste 34014, Italy

Strictly hyperbolic $n \times n$ systems of conservation laws of the form

$$u_t + f(u)_x = 0 \tag{1}$$

admit a Lipschitz semigroup of entropy weak solutions, defined within a domain of small BV functions.

A long standing conjecture is that the trajectories of this semigroup are precisely the limits of solutions to the parabolic system

$$u_t + A(u)u_x = \varepsilon u_{xx} \quad (A = Df) \tag{2}$$

as the viscosity coefficient $\varepsilon \rightarrow 0$.

Purpose of this talk is to present a proof of this fact, showing that the total variation of solutions of (2) remains uniformly small as the viscosity tends to zero. These results represent the conclusion of a joint research project, which was successful largely thanks to the contributions of Stefano Bianchini.