ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

10. Partial Differential Equations

1991 MS Classification: 35B05, 35L65, 35L67
Härterich, Jörg, Freie Universität Berlin, Germany
Heteroclinic Orbits Between Rotating Waves in Hyperbolic Balance Laws

Scalar hyperbolic conservation laws with source terms

$$u_t + f(u)_x = g(u)$$

with $x \in S^1$ possess a large number of rotating wave solutions with shocks. They can be classified via a set $\mathcal{Z}(u) \subseteq S^1$ where u takes a certain value. We look for solutions which exist globally in time and converge to different rotating waves as $t \to \pm\infty$. It is known that such heteroclinic orbits from a rotating wave u_1 to another wave u_2 can exist only if $\mathcal{Z}(u_2) \subseteq \mathcal{Z}(u_1)$. We show that this condition is also sufficient. Moreover, we describe the shock structure of the heteroclinic orbits.