

Cordier, Stéphane; Degond, Pierre; Markowich, Peter; Schmeiser, Christian
Travelling wave analysis and jump relations for Euler-Poisson model in the quasineutral limit. (English) [Zbl 0849.35105](#)
Asymptotic Anal. 11, No. 3, 209-240 (1995).

Summary: This paper is devoted to the travelling wave analysis of the Euler-Poisson model for a plasma consisting of electrons and ions. When the Debye length tends to 0, this system leads to a nonlinear hyperbolic system in a non-conservative form called quasineutral Euler system.

Our aim is to determine the admissible jump relations and shock solutions for the quasineutral Euler system as limits of travelling wave solutions for the Euler-Poisson system. We show that only one of the three types of travelling wave solutions converges to admissible shock solutions of the quasineutral Euler system.

MSC:

[35Q35](#) PDEs in connection with fluid mechanics
[76X05](#) Ionized gas flow in electromagnetic fields; plasmic flow
[76L05](#) Shock waves and blast waves in fluid mechanics

Cited in **7** Documents**Keywords:**

Euler-Poisson model; quasineutral Euler system; jump relations; shock solutions; limits of travelling wave solutions