



北京理工大学

数学与统计学院学术报告

Traveling Waves of the Vlasov–Poisson System

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地 点: 良乡校区 文萃楼 E609

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摘 要: We consider the Vlasov--Poisson system describing a two-species plasma with spatial dimension 1 . We find the necessary and sufficient conditions for the existence of solitary waves, shock waves, and wave trains of the system, respectively. To this end, we need to investigate solutions that are not BGK waves. We also classify completely in all possible cases whether or not the traveling wave is unique. The uniqueness varies according to each traveling wave when we exclude the variant caused by translation. For the solitary wave, there are both cases that it is unique and nonunique. The shock wave is always unique. No wave train is unique. In addition, we study the time-global solvability of the Cauchy problem for arbitrarily large initial data $f_{\pm}^0$ assuming that the support of the difference between the initial data $f_{\pm}^0$ and $f_{\pm}^{*,0}$ is compact in the phase space, where $f_{\pm}^{*,0}$ is the initial value of traveling waves. This talk is based on joint works with Professor Masahiro Takayama (Keio Univ.) and Professor Katherine Zhiyuan Zhang (Northeastern Univ.).