

Seminar 2024

Math

Hydrodynamic Limit of the BGK-Vlasov-Poisson Model with Massless Electrons on the Torus

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Abstract: In this talk, we discuss the hydrodynamic limit of a Vlasov-Poisson system with massless electrons that is coupled with a BGK term introduced by Bouchut. More specifically, we show that the BGK-Vlasov-Poisson system converges to an Euler-Poisson system describing cold plasma with presence of γ -law pressure. To establish suitable convergences, we use the modulated energy method by incorporating an energy functional introduced by Han-Kwan. For the specific case where $\gamma = (n + 2)/n$, we make our work completely rigorous by establishing the global existence of weak solutions to the BGK-Vlasov-Poisson system that satisfy the kinetic entropy inequality. This is a joint work with Young-Pil Choi and Dowan Koo.



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