

**Johann Radon Institute for
Computational and Applied Mathematics
der
Österreichischen Akademie der Wissenschaften**

Group Seminar

Group: Computational Methods for Direct Field Problems

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Discontinuous Galerkin methods for the Vlasov-Poisson System

One of the simplest model problems in the kinetic theory of plasma--physics is the Vlasov-Poisson system with periodic boundary conditions. Such system describes the evolution of a plasma of charged particles (electrons and ions) under the effects of the transport and self-consistent electric field. In this talk, we present some new Discontinuous Galerkin (DG) methods for the approximation of the Vlasov-Poisson system. The proposed schemes couple DG approximation for the Vlasov equation (transport equation) with finite element (conforming, non-conforming or mixed) approximation to the Poisson problem. We provide the error analysis of the methods and discuss further properties of the proposed schemes. The talk is based on joint work with J.A.Carrillo (ICREA & Universitat Autonoma de Barcelona) and Chi-Wang Shu (Brown University).

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