

Discontinuous Galerkin approximation to the Vlasov-Poisson system: from Theory to Computations

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We present a family of finite element-discontinuous Galerkin (DG) methods for the approximation of the Vlasov-Poisson system. We shall discuss the convergence and error analysis and the properties of the proposed methods. We also present numerical experiments in the 1D case that validate the theory and suggest further properties of the schemes. If time allows, in the last part of the talk, we shall discuss the possibility of combining the DG methods with some dimension reduction techniques, such as sparse grids. The talk is based on joint works with Saverio Castellanelli (UAB-CRM), J.A. Carrillo (Imperial College, UK), Soheil Hajian (Univ. Geneva) and Chi-Wang Shu (Brown University, US).