POSTER

On Landau damping for the Vlasov-HMF model

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Abstract
We consider solutions of the Vlasov-HMF equation starting from a small Sobolev neighborhood of a spatially homogeneous stationary state, satisfying a linearized stability criterion (Penrose criterion). These solutions exhibit a nonlinear Landau damping effect with a polynomial rate of damping. We prove that this result persists through time-discretization of the model by splitting methods, and also provide convergence estimates for these semi-discrete schemes.
We also consider the case of inhomogeneous stationary states, where angle-action variables can be used to prove a linear Landau damping result with an algebraic rate of damping, and provide numerical simulations to illustrate the theory.


References