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Simulation of quasilinear theory with high-order discontinuous Galerkin method DANIEL CREWS, URI SHUMLAK, University of Washington — Quasilinear theory is one of the simplest reduced models for collisionless plasma turbulence. Its similarity to Reynolds averaging suggests using the coupled quasilinear kinetic and wave kinetic equations as a model for subgrid-scale physics in reduced kinetic simulations. This work investigates such a reduced model numerically. After splitting between resonant and nonresonant interactions, diffusion coefficients from the classic Bohm-Gross dispersion relation are derived analytically and utilized. Results are compared to Vlasov-Poisson simulations. These numerical experiments are conducted using a high-order parallelized nodal explicit Runge-Kutta discontinuous Galerkin method, with benchmark results given for the linear advection-diffusion equation on a finite-interval.

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