Palindromic discontinuous Galerkin method

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We present a high order scheme for approximating kinetic equations with stiff relaxation. The objective is to provide efficient methods for solving the underlying system of conservation laws. The construction is based on several ingredients:

- a high order implicit upwind Discontinuous Galerkin approximation of the kinetic equations with easy-to-solve triangular linear systems;

- a second order asymptotic-preserving time integration based on symmetry arguments;

- a palindromic composition of the second order method for achieving higher orders in time.

The method is then tested at orders 2, 4 and 6. It is asymptotic-preserving with respect to the stiff relaxation, accepts high CFL numbers and is well adapted to parallel optimizations. The presentation will be based on [1, 2]

Références

[1] COULETTE, D., FRANCK, E., HELLUY, P., MEHRENBERGER, M., NAVORET, L., *Palindromic Discontinuous Galerkin method for kinetic equations with stiff relaxation*, arXiv:1612.09422, 2016.

[2] JAYESH BADWAIK & AL., *Task-based parallelization of an implicit kinetic scheme*, hal:01451393, 2017.

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