INVERSE LAX-WENDROFF METHOD FOR BOUNDARY CONDITIONS OF KINETIC AND RELATED MODELS

Francis Filbet and Chang Yang

Abstract

Abstract. In this paper we present a new algorithm based on Cartesian mesh for the numerical approximation of the kinetic models on complex geometry boundary. Due to the high dimensional property, numerical algorithms based on unstructured meshes for a complex geometry are not appropriate. Here we propose to adapt the inverse Lax-Wendroff procedure, which was recently introduced for conservation laws (S. Tan & C.W. Shu, JCP 229 (2010)), to the kinetic equations. Applications in 1Dx3D and 2Dx3D of this algorithm for Boltzmann type operators (BGK, ES-BGK models) is then presented and numerical results illustrate the accuracy properties of this algorithm.