



ID de Contribution: 0

Type: Non spécifié

On the stability of IMEX schemes for singular hyperbolic PDE's

jeudi 5 novembre 2015 14:00 (45 minutes)

I will discuss systems of conservation laws where some wave speeds become singular. The classic example is the low Mach number limit in gas dynamics. In the singular limit, hyperbolicity gets lost, and near the limit, explicit time discretizations become either inefficient or unstable, both due to the CFL condition. The established concept to design efficient and stable algorithms near the singular limit is a time-Implicit-Explicit splitting, called IMEX. The recent asymptotic preserving (AP) IMEX schemes are consistent with the singular limit. A key question is the asymptotic stability of these schemes. I discuss two examples: a well-known, but unstable, scheme, and an also well-known, but stable scheme. Then I present a new stability analysis for IMEX schemes, which explains the outcomes of these experiments. I also give an outlook to a new concept of splittings, the so called RS-IMEX schemes (Reference Solution IMEX), and first applications.

Orateur: NOELLE, Sebastian (RWTH Aachen, Germany)