The Cauchy problem for a quasilinear system of equations with coupling in the linearization

Jueves 5 de octubre de 2023, 12:00 horas.
Salón 13, Edificio C IIMAS
Zoom con registro previo

Resumen:
The Cauchy problem for a quasilinear system of hyperbolic-parabolic equations is addressed with the method of linearization and fixed point. Coupling between the hyperbolic and parabolic variables is allowed in the linearization and we do not assume the Friedrich's symmetrizability of the system. This coupling results in linear energy estimates that prevent the application of Banach's contraction principle. A metric fixed point theorem is developed in order to conclude the local existence and uniqueness of solutions. We show that the boundedness in the high norm and contraction in the low norm can be incorporated into the formulation of the fixed point by introducing the notion of a closed extension of the solution map. We apply our results to the Cattaneo-Christov system for viscous compressible fluid flow, a system of equations whose inviscid part is not hyperbolic.