

L^2 formulation of some hyperbolic conservation laws

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Resumen

It is customary to address hyperbolic conservation laws (or Hamilton-Jacobi equations) in functional spaces that are neither Hilbertian nor reflexive (typically L^1 , BV , C^0 , Lip , etc.). We show that, in some simple but significative cases (multidimensional scalar conservation laws, Chaplygin gas or Born-Infeld electromagnetism in one space variable), a simple L^2 formulation can be introduced, leading to straightforward well posedness and stability results. This approach can be extended to some coupled system like pressureless Euler-Poisson systems. In each case, very accurate numerical schemes can be designed according to the L^2 formulation. Reference: <http://arxiv.org/pdf/math.AP/0609761>.