

On geometric issues for systems of Conservation Laws

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For the past six years, I have worked with Prof. Dan Marchesin on several problems in the theory and applications of nonlinear conservation laws. As a result, some ideas have been put forth to aid the construction of solutions, both analytically and numerically. Some of these ideas, pertaining to the identification and construction of “separatrix solutions” [2], are hidden in the original work of Oleřnik for scalar conservation laws. In [1] we have shown how to exploit Oleřnik’s E-criterion for a broader vision with a geometrical view point. In this talk we will discuss how to go beyond the scalar case using the wave curve method for systems of conservation laws and the convex hull for fractional flux functions.

- [1] P. CASTAÑEDA (2016) “Oleřnik a traves del espejo” *Miscelanea Mat.* **62**: 63–80.
- [2] P. CASTAÑEDA, E. ABREU, F. FURTADO AND D. MARCHESIN (2016) “On a universal structure for immiscible three-phase flow in virgin reservoirs”, *Comput. Geosci.* **20**: 171–185.