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Convergence issues of usual numerical schemes approximating 1-d nonconservative hyperbolic systems

Attempts to define weak solutions to nonconservative hyperbolic systems have lead to the development of several techniques, such as Dal Maso-LeFloch-Murat's path-based theory and the vanishing viscosity solutions described by Bianchini-Bressan. While these theories enable to define weak solutions to nonconservative hyperbolic systems, difficulties arise when numerically approximating these systems. Specifically, in the neighbourhood of a discontinuity, the numerical solutions tend to not converge to the theoretically specified weak solution of the system. In this talk we investigate some methods to numerically approximate nonconservative hyperbolic systems, we discuss why these errors arise, and we describe what weak solutions of these numerical solutions converge to. This is joint work with N. Chalmers (Waterloo).