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Michael Anthony Maroun* (mmaro001@ucr.edu), 1005 Via Zapata APT 302, Riverside, CA 92507. *Number Theoretic Solutions to a Certain Nonlinear Cauchy Problem with Optimized Constraints.*

I consider the dynamics of a one dimensional flow on the interval $[0, 1]$ of the real line. The flow is constrained by a conservation principle and obeys a nonlinear Burgers' type PDE. There arises a functional equation for the solution and the analytic solutions of this functional equation have connections to number theoretic special functions. (Received September 23, 2011)