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Cauchy problem and transport equation for BV vector fields.

Abstract: We describe a recent work on the extension of the Di Perna-Lions theory to BV vector fields with absolutely continuous and bounded divergence. We show that weak solutions of the transport equation are renormalizable, obtaining as a consequence uniqueness and comparison results. These results are then used to show “generic uniqueness” properties for the Cauchy problem induced by the vector field. The proofs use some fine properties of BV functions, dyadic decomposition arguments and the theory of Young measures.