On Lorentzian metrics of low differentiability

TUE/P3
11:30–11:50

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We discuss some basic concepts of semi-Riemannian geometry in low-regularity situations. In particular, we compare two approaches to Semi-Riemannian metrics of low differentiability: the maximally "reasonable" distributional setting of Geroch and Traschen [1,2] is shown to be consistently contained in the more general setting of nonlinear distributional geometry in the sense of Colombeau [3,4].

[1] R. GEROCH AND J. TRASCHEN: Strings and other distributional sources in general relativity. *Phys. Rev. D* **36** (1987), 1017–1031.

[2] P. LEFLOCH AND C. MADARE: Definition and stability of lorentzian manifolds with distributional curvature. *Port. Math. (N.S.)* **64** (2007), 535–573.

[3] M. GROSSER, M. KUNZINGER, M. OBERGUGGENBERGER AND R. STEINBAUER: *Geometric Theory of Generalized Functions.* (Mathematics and its Applications vol 537) Kluwer 2001.

[4] R. STEINBAUER, J. VICKERS: On the Geroch-Traschen class of metrics. *Class. Quantum Grav.* **26** (2009), 065001.