

Local Causal Structures—Relating Quantum Field Theories on Different Spacetime Backgrounds

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Abstract

I will report on an investigation performed in collaboration with Claudio Dappiaggi and Nicola Pinamonti which aims at exhibiting a procedure to compare quantum field theories on different spacetime backgrounds. A thorough study of the local causal structures shows that double cones and their past boundaries can be used as the foundation to establish this relation, making use of the transition from the boundary of the cone to its bulk. As a result we get an interesting connection with the principle of general local covariance introduced by Brunetti, Fredenhagen and Verch and demonstrate the feasibility of the comparison aimed at both on the level of algebras and of states. It turns out that information about the curvature of the underlying spacetime background can be extracted from actual measurements.