Local index theory for Lorentzian manifolds
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We prove a local version of the index theorem for Dirac-type operators on globally hyperbolic Lorentzian manifolds with Cauchy boundary. In case the Cauchy hypersurface is compact, we do not assume self-adjointness of the Dirac operator on the spacetime or of the associated elliptic Dirac operator on the boundary. In this case, integration of our local index theorem results in a generalization of previously known index theorems for globally hyperbolic spacetimes that allows for twisting bundles associated with non-compact gauge groups. This is joint work with Alexander Strohmaier.