

Title: Spinor approach to 3D Lorentzian loop quantum gravity

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Abstract: <p>I will present a generalization of the spinor approach of Euclidean loop quantum gravity to the 3D Lorentzian case, where the gauge group is the noncompact $SU(1,1)$. The key tool of this generalization is the recoupling theory between unitary infinite-dimensional representations and non-unitary finite-dimensional ones, needed to generalize the Wigner-Eckart theorem to tensor operators for $SU(1,1)$.

$SU(1,1)$ tensor operators are used to build observables and a quantum Hamiltonian constraint, analogous to the one introduced by Bonzom and Livine in the Euclidean case. I will show that the Lorentzian Ponzano-Regge amplitude is a solution of the Hamiltonian constraint, by making use of the Biedenharn-Elliott relations (generalized to the case where unitary and non-unitary $SU(1,1)$ representations are coupled to each other).</p>

