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Dynamics for a 2-vertex Quantum Gravity Model

Abstract: In spite of the several approaches to implement the dynamics within the loop quantum gravity theory, it is still an open problem. In this talk we will discuss a tentative dynamics for the simplest class of graphs in loop quantum gravity: Two vertices linked with an arbitrary number of edges. This model represents two regions, in and out, separated by a boundary surface. We will use the $U(N)$ framework recently introduced by E. Livine and collaborators in order to identify area creation and annihilation operators. Finally, we will propose a Hamiltonian operator invariant under area-preserving deformations of the boundary surface and we will explore physical applications and possible generalizations.

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