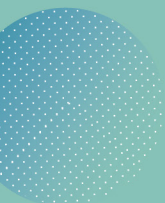




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The two-vertex model of loop quantum gravity: anisotropic reduced sectors

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Abstract

The so-called two-vertex model of loop quantum gravity has been analytically studied in the past within a $U(N)$ symmetry-reduced sector leading to a cosmological interpretation. In this work we study the simplest non-trivial two-vertex model (with four edges), using the spinorial formalism and twisted geometries to isolate the degrees of freedom and derive a canonical parametrization. We identify eight geometric parameters describing the polyhedral configurations and four twist angles characterizing the system's dynamics. Going beyond the $U(N)$ symmetry-reduced sector which can be interpreted as homogeneous and isotropic, we find three additional stable symmetry-reduced sectors: the privileged-direction sector, the bi-twist sector, and the inhomogeneous bi-twist sector. Each sector introduces degrees of anisotropy or inhomogeneity and expand the potential cosmological interpretations of the two-vertex model.

