High Energy Physics - Theory

The cosmological perturbation theory in loop cosmology with holonomy corrections

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In this paper we investigate the scalar mode of first-order metric perturbations over spatially flat FRW spacetime when the holonomy correction is taken into account in the semi-classical framework of loop quantum cosmology. By means of the Hamiltonian derivation, the cosmological perturbation equations is obtained in longitudinal gauge. It turns out that in the presence of metric perturbation the holonomy effects influence both background and perturbations, and contribute a non-trivial sector Sh in the cosmological perturbation equations.

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