Contribution ID: **428** Type: **Talk in the parallel session**

First-Order Quantum Correction in Coherent State Expectation Value of Loop-Quantum-Gravity Hamiltonian

Wednesday, 7 July 2021 11:00 (25 minutes)

Given the Loop-Quantum-Gravity (LQG) non-graph-changing Hamiltonian $\widehat{H[N]}$, the coherent state expectation value $\langle\widehat{H[N]}\rangle$ admits an semiclassical expansion in $\ell_{\rm p}^2$. In this paper, we compute explicitly the expansion of $\langle\widehat{H[N]}\rangle$ on the cubic graph to the linear order in $\ell_{\rm p}^2$, when the coherent state is peaked at the homogeneous and isotropic data of cosmology. In our computation, a powerful algorithm is developed to overcome the complexity in computing $\langle\widehat{H[N]}\rangle$. In particular, some key innovations in our algorithm substantially reduce the computational complexity in the Lorentzian part of $\langle\widehat{H[N]}\rangle$. In addition, some effects in cosmology from the quantum correction in $\langle\widehat{H[N]}\rangle$ are discussed.

Primary authors: ZHANG, Cong (University of Warsaw); Prof. HAN, Muxin (Florida Atlantic University); Mr SONG, Shicong (Florida Atlantic University)

Presenter: ZHANG, Cong (University of Warsaw)

Session Classification: Loop Quantum Gravity

Track Classification: Quantum Gravity: Loop Quantum Gravity