Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **4219** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Semiclassical geometrodynamics of homogeneous cosmology

Monday, May 27, 2024 2:30 PM (15 minutes)

We study the classical-quantum (CQ) hybrid dynamics of homogeneous cosmology from a Hamiltonian perspective where the classical gravitational phase space variables and matter state evolve self-consistently with full backreaction. We compare numerically the classical and CQ dynamics for isotropic and anisotropic models, including quantum scalar-field induced corrections to the Kasner exponents. Our results indicate that full backreaction effects leave traces at late times in cosmological evolution; in particular, the scalar energy density at late times provides a potential contribution to dark energy. We also show that the CQ equations admit exact static solutions for the isotropic, and the anisotropic Bianchi IX universes with the scalar field in a stationary state.

Keyword-1

Semiclassical Gravity

Keyword-2

Canonical QG

Keyword-3

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Session Classification: (DTP) M2-2 Gravity and Cosmology | Gravité et cosmologie (DPT)

Track Classification: Technical Sessions / Sessions techniques: Theoretical Physics / Physique théorique (DTP-DPT)