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Dirac fields in hybrid loop quantum cosmology

Monday 25 September 2017 09:55 (45 minutes)

We introduce Dirac fields in hybrid loop quantum cosmology and study their behavior as part of the primordial perturbations, additional to those of the geometry and the inflaton field. With a convenient ansatz for physical quantum states, we show how to deduce a Schrodinger equation that dictates the quantum evolution of these fermionic perturbations. Remarkably, such evolution is unitary, and couples the fermion field with an infinite sequence of quantum moments of the homogeneous geometry. We also discuss some issues related with the quantum backreaction produced by the Dirac fields.

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