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Hamiltonian Formalism of de-Sitter Invariant Special Relativity

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Abstract: The Lagrangian of Einstein's special relativity with universal parameter c (SR_c) is invariant under Poincaré transformation, which preserves Lorentz metric $\eta_{\mu\nu}$. The SR_c has been extended to be one which is invariant under de Sitter transformation that preserves so-called Beltrami metric $B_{\mu\nu}$. There are two universal parameters, c and R, in this Special Relativity (denoted as SR_{cR}). The Lagrangian-Hamiltonian formulism of SR_{cR} is formulated in this paper. The canonic energy, canonic momenta, and 10 Noether charges corresponding to the space-time's de Sitter symmetry are derived. The canonical quantization of the mechanics for SR_{cR}-free particle is performed. The physics related to it is discussed.

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