Abstract Submitted for the TSF15 Meeting of The American Physical Society

Quantization of 1+1 Dimensional Horava-Lifshitz Gravity BAOFEI LI, ANZHONG WANG, YUMEI WU, Baylor University, ZHONGCHAO WU, Institute for Advanced Physics and Mathematics, Zhejiang University of Technology — we study the quantization of the (1+1)-dimensional projectable Horava-Lifshitz gravity, and find that, when only gravity is present, the system can be quantized by following the standard Dirac quantization. The corresponding Hamilton can also be written in terms of a simple harmonic oscillator, where the expectation value of the gauge-invariant length operator defines the fundamental length of the system. When the gravity minimally couples to a scalar field, the momentum constraint can be solved explicitly only in the case where the fundamental variables are functions of time only. In this case, the coupled system can also be quantized by following the Dirac process. When the self-interaction of the scalar field vanishes, the corresponding Hamilton can be written in terms of two harmonic oscillators, one has positive energy, while the other has negative energy. A remarkable feature is that the space-time is well quantized, even when it is classically singular.

> Baofei Li baylor universtiy

Date submitted: 09 Oct 2015

Electronic form version 1.4