

Abstract

The Horava-Lifshitz gravity, having broken the symmetry of space and time, includes three objects: the spatial metric g_{ij} , the lapse variable N , and the shift variable N_i . Each of these objects have their own scaling dimensions. The action of the theory is required to be invariant under this scaling, and spatial diffeomorphism, and the temporal foliation symmetry. Noting that action can non-trivially depend on the lapse variable, we suggest to consider the Horva's approach to quantum gravity in higher dimensions such that a set of extra spacial coordinates possess a scaling dimension different from that of rest. In so so doing, we propose a new power counting renormalizable theory for quantum gravity in its UV point. We show that the IR point and UV point of the proposal possess the same number of degrees of freedom in 3, 8 and 27 extra-dimensional space-time geometry.