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Lattice quantum gravity with scalar fields

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We consider the lattice gravity model based on Euclidean dynamical triangulations incorporating degenerate tiling with a non-trivial measure term and couple it minimally to a scalar field in the quenched approximation. Our preliminary results suggest a multiplicative renormalization for the mass of the scalar field which is consistent with the shift symmetry of the discretized lattice action. We discuss the possibility of measuring mass anomalous dimension and gravitational binding energy between two scalar test particles and argue that negative energy of the bound state would imply that this model can potentially represent gravitational attraction.

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