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## Quantum gravitational decoherence

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We discuss a decoherence process due to quantum gravity effects. We assume a foamy quantum spacetime with a fluctuating minimal length coinciding on average with the Planck scale. Considering deformed canonical commutation relations with a fluctuating deformation parameter, we derive a Lindblad master equation that yields localization in energy space and decoherence times consistent with the available observational evidence. Finally, we comment on possible experimental tests based on cavity optomechanics setups with ultracold massive molecular oscillators and provide preliminary estimates on the values of the physical parameters needed for actual laboratory implementations

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