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Examination of quantum gravity effects with neutrino

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We discuss effects suggested to be induced in the neutrino physics by models of quantum gravity. In particular, quantum decoherence can lead to fewer neutrinos of all active flavours being detected in a long baseline experiments as compared to three-flavour standard neutrino oscillations. We discuss the potential of CNGS and J-PARC beams in constraining models of quantum gravity induced decoherence. Another effect is related to the interaction of energetic particles with quantum gravity induced foamy structure of space-time. This interaction might violate Lorentz invariance, so that a radiation probe does not propagate at a universal speed. We consider the limits that may be set on such violation of Lorentz invariance using data from supernova explosions and the CNGS long-baseline experiment.

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