



Contribution ID: 76

Type: **invited talk**

Bounds on Planck-scale deformation of CPT from lifetimes and interference

Wednesday, 26 June 2019 09:30 (25 minutes)

Deformed relativistic kinematics, expected to emerge in a flat-spacetime limit of quantum gravity, predicts the Planck-scale violation of CPT symmetry. Deformations of the action of CPT are derived from the kappa-deformed Poincare algebra. This entails a subtle but measurable corrections to characteristics of time evolution, e.g. particle lifetimes or oscillations in two-particle states at high energy. We argue that using the muon lifetime or quark flavour oscillations we can bound $\kappa > 10^{14}$ GeV at LHC energy and move this limit to 10^{16} GeV at future colliders.

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Session Classification: Wednesday