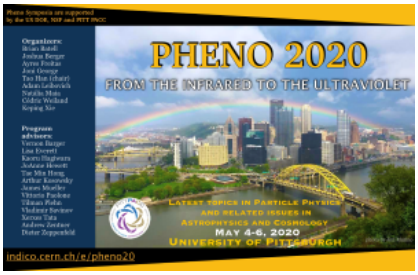

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Muonium-Antimuonium Oscillations in Effective Field Theory

Monday 4 May 2020 15:45 (15 minutes)

It is widely accepted that the standard model is not a complete theory and there is new physics to be found. One example is the experimental finding that neutrinos oscillate between flavors which is only possible if the neutrinos have non-zero mass. The flavor mixing of massive neutrinos is described by the Pontecorvo-Maki-Nakagawa-Sakata (PMNS) matrix leading to charged lepton flavor violation. Since flavor violating processes have highly suppressed branching ratios in the standard model mainly due to the tiny neutrino mass, observing lepton flavor violation (LFV), would be a clear indication of physics beyond the standard model. One possible way to search for LFV is muonium-antimuonium oscillations. This process violates muon lepton number by two units making it an important test of new physics. Using effective field theory (EFT), we calculated the mass and width differences of the mass eigenstates of muonium. Here the width difference is calculated for the first time. We believe future experiments searching for muonium oscillations would put further constraints on possible new physics.

Summary

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