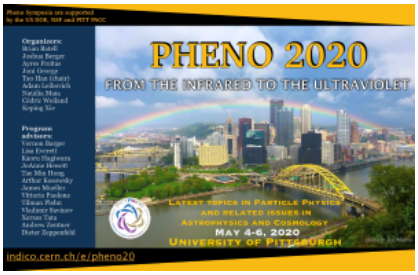

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Searches for Atmospheric Long-Lived Particles

Tuesday 5 May 2020 14:45 (15 minutes)

Long-lived particles are predicted in extensions of the Standard Model that involve relatively light but very weakly interacting sectors. In this paper we consider the possibility that some of these particles are produced in atmospheric cosmic ray showers, and their decay intercepted by neutrino detectors such as IceCube or Super-Kamiokande. We present the methodology and evaluate the sensitivity of these searches in various scenarios, including extensions with heavy neutral leptons in models of massive neutrinos, models with an extra U(1) gauge symmetry, and a combination of both in a U(1)_{B−L} model. Our results are shown as a function of the production rate and the lifetime of the corresponding long-lived particles.

Summary

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