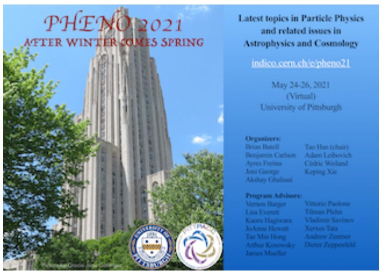

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Searching for dark gauge bosons in next-generation neutrino experiments

Tuesday 25 May 2021 17:00 (15 minutes)

Dark gauge bosons including dark photon and Z' have been important players in beyond-the-Standard-Model phenomenology including their potential connection to dark matter. However, their feeble interactions with the Standard Model (SM) particles motivate the use of high-intensity beam-based experiments including neutrino experiments. If neutrinos are non-trivially charged under such dark gauge bosons, the neutrino scattering can be a good channel of investigating their existence, as the scattering may arise via an exchange of a dark gauge boson. In my talk, I will revisit this interesting possibility at a couple of neutrino experiments, DUNE and JSNS^2, in the neutrino-electron scattering channel, carefully taking into account the interference effect between the SM processes and new physics contributions, and show that these experiments can probe regions of parameter space that have never been explored before. I will point out that remarkably the destructive interference effect enables us to investigate their parameter space by deficit especially in beam-focusing neutrino experiments such as DUNE.

Summary

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