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Particle Physics at LPTHE

Mardi 14 Fevrier 2023, 14 :00
LPTHE, Library and Zoom (link in the comments)(Zoom link : https ://cern.zoom.us/j/62879747924?pwd=ay9MUllDYWlacHRqYmQ3VjdZcXcydz09)
Domaines : hep-ph

Titre : *Model agnostic probes for dark sectors at neutrino experiments*

Orateur : **Sonali Verma**

Résumé : *In this talk (based on arxiv :2211.13253), I will consider light-dark sectors (DS) interacting with the Standard Model (SM) through irrelevant portals motivated by general principles. I will talk about deriving bounds on such scenarios using the decay of dark sector excitations inside the neutrino detector, placed downstream from the target. Our approach in this work is model agnostic and applies to a wide range of dark sector models. In this approach, the dark sector is characterized by two energy scales : a UV scale (mass scale of mediators generating the portals) and an IR scale (mass gap of the dark sector). At intermediate energies, far away from these scales, the theory is approximately scale-invariant and allows the calculation of production rates independent of the threshold corrections. We look at various DS production processes such as meson decays, direct partonic production, and dark bremsstrahlung. We find that upcoming neutrino experiments can probe new parameter space regions, inaccessible in current high-energy experiments, and are comparable to fixed-target/beam-dump experiments. Future neutrino experiments will probe new parts of parameter space on a fairly shorter time scale, as compared to other proposed LLP experiments, and provide an efficient probe of dark sectors.*
