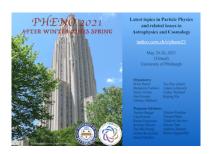
Phenomenology 2021 Symposium



Contribution ID: 1236 Type: Axions & ALPs

Search for feebly interacting particles with NA62

Monday 24 May 2021 16:30 (15 minutes)

The high-intensity setup and detector performance make the NA62 experiment at CERN particularly suited for searching new physics effects from different scenarios involving feebly interacting particles in the MeVGeV mass range.

A search for the $K+\to \pi+X$ decay, where X is a long-lived feebly interacting particle, is performed through an interpretation of the $K+\to \pi+vv^-$ analysis of data collected in 2017-2018. Model- dependent upper limits are obtained assuming X to be an axion-like particle with dominant fermion couplings or a dark scalar mixing with the Standard Model Higgs. Upper limits set on the branching ratio BR($K+\to \pi+X$) improve on current limits for mX below 260 MeV/c2 and rest lifetimes above 100 ps.

A search for $K+\to \mu+\nu X$, where X is a massive invisible particle, is performed using the 2016-2018 data set. The X particle is considered a scalar or vector hidden sector mediator decaying to an invisible final state. Upper limits of the decay branching fraction for X masses in the range 10-370 MeV/c2 are reported for the first time, ranging from O(10-5) to O(10-7).

A study of a sample of 4×10^9 tagged $\pi0$ mesons from $K+\to\pi+\pi0(\gamma)$ is performed, searching for the decay of the $\pi0$ to invisible particles. No signal is observed in excess of the expected background fluctuations. An upper limit of 4.4×10^{-9} is set on the branching ratio at 90% C.L. improving on previous results by a factor of 60.

Summary

Authors: CENCI, Patrizia (INFN Perugia (IT)); VOLPE, Roberta (Comenius University)

Presenter: VOLPE, Roberta (Comenius University)

Session Classification: Axions & ALPs II