Contribution ID: **632** Type: **Parallel Talk**

Latest results and future prospects of the NA64 experiment at CERN SPS

Thursday, 7 July 2022 12:15 (15 minutes)

The search for Dark Matter (DM) is one of the hottest topics of modern physics. Despite the various astrophysical and cosmological observations proving its existence, its elementary properties remain to date unknown. In addition to gravity, DM could interact with ordinary matter through a new force, mediated by a new vector boson (Dark Photon, Heavy Photon or A'), kinetically mixed with the Standard Model photon. The NA64 experiment at CERN fits in this scenario, aiming to produce DM particles using the 100 GeV SPS electron beam impinging on a thick active target (electromagnetic calorimeter). In this setup the DM production signature consists in a large observed missing energy, defined as the difference between the energy of the incoming electron and the energy measured in the calorimeter, coupled with null activity in the downstream veto systems. Recently, following the growing interest in positron annihilation mechanisms for DM production, the the NA64 collaboration has performed preliminary studies with the aim to run the experiment with a positron beam, as planned within the POKER (POsitron resonant annihilation into darK mattER) project.
This talk will present the latest NA64 results and its future prospects, reporting on the progresses in the positron beam run and discussing the sensitivity of the experiment to DM models alternative to the Dark Photon.

In-person participation

Yes

Primary author: MARSICANO, Luca (Istituto Nazionale di Fisica Nucleare)

Presenter: MARSICANO, Luca (Istituto Nazionale di Fisica Nucleare)

Session Classification: Beyond the Standard Model

Track Classification: Beyond the Standard Model