



Contribution ID: 195

Type: **Parallel Talk**

## Dark sector studies with the PADME experiment

*Thursday, 7 July 2022 11:45 (15 minutes)*

Today the investigation of dark matter nature, its origin, and the way it interacts with ordinary matter plays a crucial role in fundamental science. Several particle physics experiments at accelerators are searching for hidden particles signals to contribute setting more stringent limits on the characteristics of dark matter.

The Positron Annihilation into Dark Matter Experiment (PADME), ongoing at the Laboratori Nazionali di Frascati of INFN, is looking for hidden particle signals by studying the missing-mass spectrum of single photon final states resulting from positrons annihilation on the electrons of a fixed target. PADME is expected to reach a sensitivity of up to  $10^{-6}$  on  $\epsilon^2$  (kinetic mixing coefficient) representing the coupling of a low-mass dark photon ( $m < 23.7\text{MeV}$ ) with ordinary photons.

By measuring the cross-section of the process  $e^+ e^- \rightarrow \gamma\gamma$  at  $\sqrt{s}=21\text{ MeV}$  and comparing it with SM expectation, it is also possible to set limits on hidden particles decays to photon pairs. In this talk details on the PADME measurement of two-photon annihilation cross-section will be illustrated with its implication to the dark matter studies.

### In-person participation

Yes

**Primary author:** GIANOTTI, Paola (LNF)**Presenter:** VALENTE, Paolo (Istituto Nazionale di Fisica Nucleare)**Session Classification:** Beyond the Standard Model**Track Classification:** Beyond the Standard Model