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The Scientific Program of the PADME experiment

Monday, July 17, 2023 12:40 PM (20 minutes)

The Positron Annihilation into Dark Matter Experiment (PADME) is a fix-target experiment ongoing at the Laboratori Nazionali di Frascati of INFN whose main goal is searching for dark matter signals in electron-positron annihilations in the MeV mass range [1].
First sets of physics-grade data have been collected over the last few years with the main goal to look for a Dark Photon in the missing mass of single-photon final states [2]. We discuss in the talk the first physics results of PADME that include the most precise measurement of the total cross-section of electron-positron annihilation into photons at $\sqrt{s}$ = 20 MeV.
We also illustrate the expected sensitivity and the analysis strategy of the PADME data set, collected at $\sqrt{s} \sim$ 17 MeV at the end of 2022, for the resonant production of a X_{17} particle.
PADME owns the unique opportunity of confirming/disproving the particle nature of the anomaly observed in several spectroscopic measurements performed be the ATOMKI collaboration on highly excited light nuclei [3] in the angular distribution of e^+e^- pairs produced by the de-excitation process.

References
[1] M. Raggi and V. Kozhuharov, Adv. High Energy Phys. 2014 (2014) 959802, arXiv:1403.3041 [physics.ins-det].
[2] P. Abicocco et al., JINST 17 no. 08, (2022) P08032, arXiv:2205.03430 [physics.ins-det].
[3] F. Bossi et al., JHEP 09 (2022) 233, arXiv:2204.05616 [hep-ex].
[4] A. J. Krasznahorkay et al., Phys. Rev. Lett. 116 (Jan, 2016) 042501.
A. J. Krasznahorkay et al., Phys. Rev. C 104 (Oct, 2021) 044003.
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Is this abstract from experiment?

Yes

Name of experiment and experimental site

PADME

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

No

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Presenter: LONG, Elizabeth Sarah

Session Classification: High Energy Particle Physics

Track Classification: Main topics: High Energy Particle Physics