

Study of the X17 anomaly with the PADME experiment

Thursday, 19 October 2023 14:30 (20 minutes)

Studying Internal Pair Creation produced in the de-excitation of some light nuclei, the ATOMKI collaboration spotted an anomaly in the opening angle of the outgoing e^+e^- pair. This anomaly seems not related to any nuclear physics effects but due to the creation and subsequent decay of a new particle of mass approximately 17 MeV (X17). The existence of such state, if confirmed, will represent a real breakthrough in the search for physics beyond the Standard Model.

The Positron Annihilation into Dark Matter Experiment (PADME) ongoing at the Laboratori Nazionali di Frascati of INFN, has been conceived to search for dark sector particles by studying positron annihilations on the electrons of a fixed target. Thanks to the possibility to change the positron beam energy, PADME has the unique opportunity to rule out or to confirm the existence of the X17. In fact, if real, the new particle has to be produced resonantly via the annihilation process $e^+ e^- \rightarrow X$ and then identified via its decay via $e^+ e^-$.

The talk will present an overview of the PADME setup and of the dedicated data taking at ~ 280 MeV beam energy performed in Autumn 2022 to produce the X17 at resonance.

Parallel Session

Fundamental Symmetries / New Physics Searches

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Session Classification: Symmetries and New Physics