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First results of the PADME Experiment and near-term plans

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PADME is a fixed-target missing-mass experiment that searches for the dark photon and other dark sector particles using a beam of positrons with maximum energy of 500 MeV. The detector, located at the Laboratori Nazionali di Frascati near Rome, Italy, has already collected initial physics-grade data over the last few years. Here we present the first physics results of PADME, including one of the most precise measurements to date of the total cross-section of electron-positron annihilation into photons. We also discuss near-term plans for the experiment, such as a direct search for on-shell X17 production, for which data taking is currently ongoing. PADME is likely capable of providing independent confirmation of the excesses observed in the ATOMKI spectroscopic measurements with Beryllium and Helium. These prospects will also be discussed.

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