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The PADME experiment at LNF-INFN

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Despite the impressive success of the Standard model (SM) in describing nature it still fails in finding the answers for a few astrophysics phenomena, including the lack of antimatter in the Universe and what Dark Matter is made of. Recently, models proposing the existence of a whole new world of particles, the so-called Dark sector (DS), regained interest. The PADME experiment at LNF-INFN aims to search for new light states, which may act as a portal between the SM and the DS, employing positron-on-target annihilation technique. Operating since autumn 2018, PADME accomplished successfully its first two periods of data taking at the DAΦNE Linac, corresponding to O(10^{13}) positrons on target. The sensitivity to new light states depends on the reliable reconstruction of the events in a high instantaneous rate environment, precise knowledge of the background processes, and detailed Monte Carlo simulation of the experimental setup. The design and the construction of the PADME experiment will be described and the first physics results using part of the collected data will be presented.

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