

The PADME experiment calorimeters for missing mass dark photon searches

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The PADME experiment at the Frascati Beam-Test Facility (BTF) aim at searching for invisible decays of a dark photon A' , by measuring the missing mass in fixed-target annihilations of a positron beam: $e^+ e^- \rightarrow \gamma A'$. The measurement requires a precise determination of the momentum of the recoil photon, performed by means of a highly-segmented, high-resolution and low-threshold BGO crystal calorimeter, complemented by a fast, high-efficiency, fast Cherenkov calorimeter, for recovering very small angle photon events, at the same time fighting the Bremsstrahlung and three-photons decay background. Stringent requirements on the efficiency, resolution and timing performance push the design of calorimeters, also from the point of view of mechanical construction, readout and calibration.

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