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Operation and performance of the PADME active target

Large size and thin high-quality polycrystalline diamond were used to build the full carbon active target of the PADME experiment, at the Beam Test Facility (BTF) of the Laboratori Nazionali di Frascati, searching for a dark photon of mass up to about 23.7 MeV.

The diamond sensors were ordered from a US commercial firm and graphitic electrodes on the surfaces were produced by a UV excimer laser at the University of Salento.

The full carbon active target has a size of 2x2 cm2 and a thickness of 100 microns. Both sensor surfaces host strip electrodes with a pitch of about 1 mm, oriented in orthogonal directions in the two planes. It is intended to acts as a beam and luminosity monitor by reconstructing at each bunch the beam intensity and profile in two orthogonal projections.

The detector is in operation since the beginning of September 2018. We review the status, the operation experience, and the performance of this device in the PADME experiment as measured so far.

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