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Performance of Prototypes for the PANDA Barrel EMC (PANDA)

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The PANDA experiment will be part of the future Facility for Antiproton and Ion Research (FAIR) and aims at the study of strong interaction within the charm sector via antiproton proton collisions up to antiproton momenta of $15 \text{ GeV}/c$. Reflecting the variety of the physics program the PANDA detector is designed as a multi-purpose detector able to perform tracking, calorimetry and particle identification with nearly complete coverage of the solid angle and, adhering to fixed target kinematics, is comprised of a Target and Forward Spectrometer. The Electromagnetic Calorimeter (EMC) contained inside the Target Spectrometer is based on cooled PbWO_4 scintillator crystals. In order to ensure an excellent performance throughout the large dynamic range of photon/electron energies reaching from a few MeV up to 15 GeV an extensive prototyping phase is mandatory. This contribution describes the measured response of the EMC barrel part prototype PROTO60 at the largest design energy to secondary beams provided by SPS at CERN. In addition to PROTO60 a tracking station comprised of prototypes for the PANDA Micro Vertex Detector was deployed, providing precise position information of the $15 \text{ GeV}/c$ positrons. For calibration purposes a 150 GeV muon beam and cosmic radiation, in combination with estimations from GEANT4 simulations were used. The obtained performance concerning energy, position and time information is presented. An outlook on the final barrel EMC design and the next generation prototype PROTO120 will be provided.

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