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## Calibration and performance assessment of the TOF-Wall detector of the FOOT Experiment

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We report on the calibration and performance of the TOF-Wall detector of the FOOT (FragmentatiOn Of Target) experiment. The experiment aims at measuring the fragmentation cross-section of 200–800 MeV/u carbon and oxygen ions impinging onto carbon and polyethylene targets for applications in hadrontherapy and radioprotection in space. The TOF system of the experiment is composed of a thin plastic scintillator, positioned in the upstream region of the experiment, and the TOF-Wall. This system allows the identification of the charge of each fragment by measuring the energy deposited in the TOF-Wall and the time of flight (TOF) between the two detectors. The TOF-Wall is composed of 20 + 20 plastic scintillator bars arranged on two orthogonal layers, coupled to silicon photomultipliers, covering an active area of 40 cm x 40 cm. The analog signals are digitized by the WaveDAQ system. The TOF-Wall detector was characterized by scanning its surface with 400 MeV/u oxygen ions, and by detecting the fragments produced by a carbon ion beam onto a graphite target. The results for the TOF-Wall timing performance with different impinging particles and the energy calibration of the detector will be reported in this contribution. A time resolution of 41 ps was obtained between the two layers of the TOF-Wall using 200 MeV/u carbon ions, corresponding to a contribution of about 20 ps to the time resolution of the TOF system. The energy resolution achieved with carbon ions was 4-5% when both layers are considered. The fragments produced by the C-C interactions were used to study the saturation of the plastic scintillator bars as a function of the released energy and of the impinging ions. The uniformity of the performance on the whole TOF-Wall area was also analyzed and will be discussed.

### Collaboration

on behalf of the FOOT experiment

**Primary author:** MORROCCHI, MATTEO (University of Pisa and INFN Pisa)

**Presenter:** MORROCCHI, MATTEO (University of Pisa and INFN Pisa)

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