

## Measurements of nuclear fragmentation cross sections with the FOOT experiment

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Nuclear fragmentation processes significantly impact particle therapy and space radiation protection, where accurate cross section measurements are needed for refining treatment planning and shielding strategies. Despite extensive research efforts in recent years, experimental data remain limited for double-differential cross sections, particularly in the energy range of 100–1000 MeV/nucleon. This gap affects the optimization of treatment plans, where nuclear interactions alter dose distributions, and the development of spacecraft shielding, since fragmentation processes are a critical source of radiation exposure for astronauts.

The main goal of the FOOT (FragmentatiOn Of Target) experiment is to tackle these needs by providing measurements of double differential fragmentation cross sections of light elements ( $Z \leq 10$ ) in the energy range of interests in medical and space applications.

Two different setups were designed for this scope and data have already been carried out in several campaigns. An overview of the state of the art of the apparatus is described, focusing on features and performances of the tracking detectors. Finally, the preliminary results of cross section measurements obtained with a  $^{16}\text{O}$  beam at the GSI facility are shown.

**Primary author:** UBALDI, Giacomo (Istituto Nazionale di Fisica Nucleare)

**Presenter:** UBALDI, Giacomo (Istituto Nazionale di Fisica Nucleare)

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