

INSTRUMENTS AND METHODS FOR THERANOSTIC RADIOISOTOPE PRODUCTION AT THE BERN MEDICAL CYCLOTRON

Thursday 27 May 2021 05:12 (18 minutes)

Radioisotopes for theranostics are essential for nuclear medicine developments. Their production using solid target stations is challenging and new instruments and methods derived from particle physics are needed. A research program is ongoing at the 18 MeV Bern medical cyclotron, equipped with a solid target station and a 6 m long Beam Transfer Line ending in a separate bunker. To bombard compressed powder pellets, novel target coins were conceived and realized together with methods to assess the beam energy and the production cross-sections. The EoB-activity is measured with a CdZnTe (CZT) detector. To accurately assess the properties of the beam, novel non-destructive one- and two-dimensional beam monitoring detectors were developed. An ultra-compact active irradiation system based on a novel magnetic lens and two-dimensional beam detectors is under development. Results on Er-165, Tb-155, Ga-68, Cu-61, Cu-64, Sc-43, Sc-44 and Sc-47 production are presented.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

Funding information

This research was partially funded by the Swiss National Science Foundation (SNSF). Grants: 200021_175749 and CRSII5_180352.

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Session Classification: Tech Transfer Posters

Track Classification: Technology Transfer