ASP2014

Report of Abstracts

Abstract ID : **131**

Radionuclide production and radiation therapy

Abstract content

Status: Approximately one half of the about 20,000 particle accelerators in operation worldwide are installed in hospitals and employed for radionuclide production and cancer radiation therapy. Radioactive isotopes are widely used in the physical and biomedical sciences as radiotracers, in diagnostics (which makes 95% of all medical uses) and in therapy. All radionuclides commonly administered to patients in nuclear medicine are artificially produced, either in nuclear reactors or with particle accelerators, usually a cyclotron. The lecture will first illustrate the characteristics required to medical radionuclides and compare reactor- versus accelerator-production. Next it will address production with a cyclotron in mode details, discussing production rate, cross-section and targetry. Examples will be given of the most common radionuclides used in medicine, for both diagnostics and therapy, and of the nuclear reactions employed to produce them. A large fraction of cancer patients undergo radiation therapy at some stage of their treatment. Most of treatments are delivered with electron linacs operating in the 6-26 MV range, including advanced modalities such as cyberknife, intra-operative radiation therapy (IORT) and intensity modulated radiation therapy (IMRT). Although the number of hadron therapy accelerators is still small due to cost and size of the facility, they are slowly growing in Europe, USA and Japan. A brief overview will be given of treatment modalities with electron/photon beams and proton/carbon ions.

Summary

Primary author(s) : SILARI, Marco (CERN)

Presenter(s) : SILARI, Marco (CERN)

Status: SUBMITTED

Submitted by **MUANZA, Steve Guy** on **Monday 04 August 2014**