Contribution ID: **157** Type: **Parallel Talk**

Neutron source based on ^{7}Li(p,n)^{7}Be reaction for Boron Neutron Capture Therapy

Monday 23 October 2017 13:30 (25 minutes)

If Boron Neutron Capture Therapy is to become a practical option, accelerator-based sources of high fluxes of epithermal neutrons are essential. Generation of low energy neutron can be achieved by ^{7}Li(p,n)^{7}Be reaction using accelerator-based neutron source. Much work has been performed on development of high-flux compact proton accelerators, but a doselimiting component remains design of the neutron production target. Specifically, lithium has a low melting point (180°C) and low thermal conductivity (44 W/m°C). In this study, therapeutic gain and tumor dose per target power, as parameters to evaluate the treatment quality, were calculated. Energies near the reaction threshold for deep-seated brain tumors were employed. These calculations were performed with the Monte Carlo N-Particle (MCNP) code. As a result, a good therapeutic gain was obtained with a simple but effective beam shaping assembly. Also, heat transfer evaluations of a lithium target designed were performed by ANSYS software. The target designed show that the peak lithium temperature can be held below 150°C with indalloy flowing by a cooper microchannels plate.

Primary authors: MUSACCHIO GONZÁLEZ, Elizabeth (Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear, Cuba.); MARTÍN HERNÁNDEZ, Guido (Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear, Cuba.)

Presenter: MUSACCHIO GONZÁLEZ, Elizabeth (Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear, Cuba.)

Session Classification: Parallel Sessions - NINST

Track Classification: Nuclear Instrumentation and Facilities