Contribution ID: **73**   Type: **not specified**

Design of new brachytherapy source using PHITS code/Phits を用いた新規密封小線源治療用線源の設計

Thursday, 16 November 2023 15:00 (2 hours)

The purpose of this research is to design new radionuclides suitable for brachytherapy sources. Brachytherapy is one of the radiotherapy technique which sealed radionuclides in capsules are inserted into the body. Photons, electrons from a sealed source are usually used. Dose rate can be controlled using a variety of irradiation setup, such as placement and irradiation time to the patients. In some case for the treatment, the biological effects of high-dose-rate irradiation of brachytherapy are superior to those of external beam using medical LINAC. Currently, only a limited number of nuclides such as ^{60}Co, ^{90}Sr, ^{106}Ru, ^{125}I, ^{137}Cs, ^{192}Ir, ^{198}Au are used in clinical practice. Other radionuclide may also have useful dose effects for the treatment, but not all have been investigated yet. In this study, we simulate the dose properties of radionuclides for brachytherapy based on the AAPM (American association of physicists in medicine) TG-43 method [1,2] using PHITS code [3].

References
[1] M. J. Rivard et al., "Updated of AAPM Task Group No.43 Report: A revised protocol for brachytherapy dose calculations.", Med. Phys. 31(3)2004.
[2] M. J. Rivard et al., "Supplement2 for the 2004 update of the AAPM Task Group No.43 Report: Joint recommendations by the AAPM and GEC-ESTRO", Med. Phys. 44(9)2017.
[3] T. Sato, Y. Iwamoto, S. Hashimoto et al., "Features of Particle and Heavy Ion Transport code System (PHITS) version 3.02", J. Nucl. Sci. Technol. 55(5-6), (2018), pp. 684-690.

Primary author: MAKINAGA/牧永, Ayano/あや乃 (RIKEN Nishina Center/理化学研究所仁科加速器科学研究センター)

Co-authors: OTSU/大津, Hideaki/秀暁 (RIKEN Nishina Center/理化学研究所仁科加速器科学研究センター); HIRABAYASHI/平林, Yoshiharu/義治 (Hokkaido University/北海道大学)

Presenter: MAKINAGA/牧永, Ayano/あや乃 (RIKEN Nishina Center/理化学研究所仁科加速器科学研究センター)

Session Classification: Poster presentation