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[P19] Design of real-time absolute epi-thermal neutron flux intensity monitor with LiCaF detector

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In recent years, BNCT, a new radiation therapy for cancers, has attracted attention. A boron compound that can accumulate only in cancer cells is administered into tumor cells in a human body and irradiated with low-energy neutrons. Then 10B and low-energy neutron cause a (n,α) reaction to kill only the cancer cells with produced charged particles. In BNCT epi-thermal neutrons are used aiming at treatment of deep-seated cancers. The number of epithermal neutrons irradiated determines the therapeutic effect. Therefore, it is crucial to know the absolute intensity of the epi-thermal neutrons. In this study, we aim to develop a novel monitor that measures the absolute intensity of the epithermal neutron flux on the human body surface in real time. As the elemental detection device, we used a scintillator called LiCaF. LiCaF has sensitivity to neutron via 6Li(n,α)3H reaction. Thus, the number of neutrons cannot be estimated directly from the measured value, because the sensitivity has an energy dependence. Therefore, we are developing a monitor having a flat efficiency for neutron energy by covering a neutron absorber around LiCaF. As a result of design, the detection efficiency of the monitor was successfully made flat with various-thickness boron absorbers.

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