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## **Characterizations of Cerenkov Radiation in Fiber-Optic Radiation Sensor for High Energy Electron Beam Therapy Dosimetry**

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In this study, a fiber-optic radiation sensor has been developed using a small, water-equivalent organic scintillator for electron beam therapy dosimetry. Usually, two kinds of light signals such as fluorescent and Cerenkov radiations are generated in a fiber-optic radiation sensor when a high energy electron beam is irradiated. A fluorescent light signal is produced in the scintillator and is transmitted through a plastic optical fiber to a remote light measuring device such as a PMT or a photodiode. Cerenkov radiation could be also produced in the plastic optical fiber itself and be detected by a light measuring device. Therefore it could cause problems or limit the accuracy to detect a fluorescent light signal that is proportional to dose. The objectives of this study are to measure, characterize and remove a Cerenkov radiation generated in a fiber-optic radiation sensor. The intensity of Cerenkov radiation is measured and characterized as a function of incident angle of electron beam from a LINAC, as a function of electron beam energy, and as a function of electron beam size. Also, a subtraction method using a background optical fiber without a scintillator is investigated to remove a Cerenkov radiation.

**Keywords :** Cerenkov Radiation, Fiber-Optic Radiation Sensor, Scintillator