Temperature variations as a source of uncertainty in medical fiber-coupled organic plastic scintillator dosimetry - DTU Orbit (15/12/2018)

**Temperature variations as a source of uncertainty in medical fiber-coupled organic plastic scintillator dosimetry**

Fiber-coupled organic plastic scintillators have potential applications in medical dosimetry related to, for example, brachytherapy and external beam radiotherapy with MV photons. As medical dosimetry generally strives for high accuracy, we designed a study to assess if the light yield from commonly used scintillating fibers would change with temperature in the clinical range (15–40 °C). The study showed that the light yield in the peak regions of the scintillators studied decreases linearly with increasing temperature. For the blue BCF-12 and the green BCF-60 from Saint-Gobain, France we found temperature coefficients of −0.15 ± 0.01%/K and −0.55 ± 0.04%/K, respectively. These values are sufficiently large to warrant careful consideration for clinical measurements. © 2013 Elsevier Ltd. All rights reserved.

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