

Title: A systematic review on the silica fibre thermoluminescence dosimeters for medical applications

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Abstract: Silica fibre thermoluminescence (TL) dosimeters have demonstrated versatility in medical and industrial, offering high spatial resolution, sensitivity, water resistance, and insensitivity to electromagnetic fields. A systematic review focusing on the medical applications of silica fibre TLDs is conducted, highlighting the potential of these materials in medical radiation dosimetry. Despite some limitations, such as non-linearity at low energies and relatively high signal fading, silica fibre TL dosimeters have shown excellent TL performance. However, their application in clinical practice is yet to be established since the TL responses for a wide range of doses and energies are not accurately certified yet.

Keywords: Silica Fibre, Thermoluminescence Dosimeter (TLD), Medical Applications, Radiation Dosimetry, Sensitivity, Spatial Resolution, Signal Fading, Clinical Implementation

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