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### Biography

David Bradley, Emeritus Professor of the University of Surrey and also Head of the Centre for Biomedical Physics at Sunway University, works in radiation and applied nuclear physics, predominantly in regard to medical applications. His work has led to commercial applications, with contributions underpinning the formation of two University spin-out companies, TrueInvivo Ltd in the UK and Lumisyns Sdn. Bhd. in Malaysia, both developing luminescence systems for medical dosimetry. He is Consulting Editor (previously Editor-in-Chief) of the Elsevier Journals *Applied Radiation & Isotopes* and *Radiation Physics & Chemistry* and latterly Editor-in-Chief of the *British Journal of Radiology*. He is also President of the International Radiation Physics Society.

**Title: Time-resolved Dose Measurements of Linear Accelerator Pulses using a Fibre Optic Sensor: Applications and Challenges**

### Abstract

We present time-resolved radioluminescence (RL) measurements from P-doped silica optical fibre, demonstrating potential utility in pulsed source dosimetry. When subjected to 140 MU/min from a 6 MV photon linac source, a 220  $\mu\text{m}$ -core fibre has produced a RL response of  $720 \pm 20$  photon counts/pulse from a saw-tooth  $\sim 40 \mu\text{s}$  duration return-to-baseline waveform. Conversely, the Cerenkov *stem signal* within the radiation insensitive carrier fibre is observed to offer an amplitude amounting to a little less than 3% of that of the P-doped fibre, the sharply spiked response being of  $\sim 2 \mu\text{s}$  duration. On the basis of these results, the practical applications and the challenges in the establishment of an effective dosimetry system are discussed.