

## Comparison between $\text{Al}_2\text{O}_3\text{:C}$ pellets and DIODEs for TSEB *in vivo* dosimetry using an anthropomorphic phantom

Almeida, S.B.<sup>(1)</sup>, Villani, D.<sup>(1)</sup>, Sakuraba, R.K.<sup>(2)</sup>, Rezende, A.C.P.<sup>(2)</sup> and Campos, L.L.<sup>(1)</sup>

(1) Radiation Metrology Center, Instituto de Pesquisas Energéticas e Nucleares, Av. Prof. Lineu Prestes, 2242 – Cidade Universitária, São Paulo – SP, Brazil.

(2) Radiation Therapy Department. Hospital Israelita Albert Einstein. Av. Albert Einstein, 665 – Morumbi.

The Total Skin Electron Beam (TSEB) therapy is a technique that aims to provide skin surface homogeneous absorbed dose in order to treat cutaneous T-cell lymphomas, both for curative and palliative purposes with electron beams penetrating a few millimeters into the skin, reaching the affected parts without affecting internal organs. (Report 23, AAPM). *In vivo* dosimetry has become an important role for the treatment of total skin irradiation within a rigorous quality assurance. The luminescent dosimeters, such as TLDs and OSLDs have proven to be very useful for the verification of the dose distribution and prescribed for the patient as the dose may differ from place to place due to patient body geometry, overlapping of structures and asymmetries of the radiation field [1]. Other routine *in vivo* dosimetry tool are the DIODEs and they as well help validating radiation therapy dosimetry.  $\text{Al}_2\text{O}_3\text{:C}$  OSL pellets manufactured and marketed by REXON Components and TLD Systems has already been characterized for TSEB applications [2]. The aim of this work is to compare the performance of  $\text{Al}_2\text{O}_3\text{:C}$  OSL pellets from REXON to *in vivo* TSEB dosimetry with silicon DIODEs QED<sup>TM</sup> detectors from Sun Nuclear (EUA) using an anthropometric phantom. Dosimeters and diodes were previously characterized for 6 MeV HDTSe- electron beams and then placed over an Anderson Rando® anthropomorphic phantom, evaluating the body dose distribution. The reference point of measurement was the umbilicus as recommended by formalism [3]. The results showed that the  $\text{Al}_2\text{O}_3\text{:C}$  OSL pellets presented acceptable results, but some greater variation of the response in relation to silicon diodes were found due to its considerable rotational dependency.

**Keywords:** *In vivo* dosimetry,  $\text{Al}_2\text{O}_3\text{:C}$ , silicon DIODEs

[1] Almeida et al. Radiation Physics and Chemistry (in press). 2018. <http://dx.doi.org/10.1016/j.radphyschem.2018.05.025>

[2] Almeida et al. Journal of Luminescence. 198, 2018, 497-501.

[3] AAPM, Total Skin Electron Therapy: "Technique and Dosimetry", AAPM Report N°23, 1987.