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#9-18 Extending Experimental Evaluation of TL and OSL Dosimeters with Monte Carlo Simulations for Enhanced Dosimetric Modeling

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This research builds upon the findings of Zidouh et al. (2023), which involved a thorough experimental comparison of thermoluminescent (TL) and optically stimulated luminescent (OSL) dosimetry systems in accordance with international standards set by the International Electrotechnical Commission (IEC) and the International Commission on Radiological Protection (ICRP). In this first part, the performance of both dosimeters was evaluated experimentally for homogeneity, linearity, energy dependence, and angular dependence. In the present work, we complement these findings with Monte Carlo simulations using the MCNP and TOPAS codes. These simulations replicate the experimental conditions, allowing a detailed comparison of the measured and simulated dose responses. The Monte Carlo simulations provided further insights into the physical behavior of the dosimeters. The results emphasize the strengths and limitations of each dosimeter type for various radiation protection applications while illustrating the utility of Monte Carlo simulations for accurate dosimetric modeling.

Primary authors: Dr ZIDOUH, Ibtissam (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc); Dr BELLAHSAOUIA, Meryeme (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc); Dr ELAARABI, Deiaa (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc); Dr ARECTOUT, Assia (ERSN, Faculty of Sciences, Abdelmalek Essaadi University, Tetouan, Morocco); KABACH, Oudie (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc); Prof. GOUIGHRI, Mohamed (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc); Dr ELKHOUKHI, Taher (CNESTEN, Safety and Security Department, BP. 1382, RP. 10001, Rabat, Morocco); Prof. CHAKIR, El Mahjoub (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc)

Presenters: Dr ZIDOUH, Ibtissam (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc); Dr BELLAHSAOUIA, Meryeme (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc); Prof. CHAKIR, El Mahjoub (Materials Physics and Subatomics Laboratory, Physics Department, University Ibn Tofail, Kenitra, Moroc)

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