

LUMDETR 2024



BOOK OF ABSTRACTS

12TH INTERNATIONAL CONFERENCE ON
Luminescent Detectors and Transformers of
Ionizing Radiation

JUNE 16-21, 2024, RIGA, LATVIA

ORGANIZERS:



INSTITUTE OF SOLID STATE PHYSICS
UNIVERSITY OF LATVIA



UNIVERSITY OF LATVIA
FACULTY OF PHYSICS,
MATHEMATICS
AND OPTOMETRY

SUPPORTERS:



UNIVERSITY
OF LATVIA



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Organized by:

Institute of Solid State Physics, University of Latvia
Foundation of the Institute of Solid States Physics (LU CFI Fonds)
Faculty of Physics, Mathematics and Optometry, University of Latvia

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WeK-13

Near Threshold Electron Emission Spectroscopy Towards Dosimetry of Nanovolumes

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Nano-dosimetry (ND) is inspired by modern radiation therapy (RT) technologies and molecular and micro radiobiology needs. ND aims to detect radiation dose absorbed by nano volumes.

Modern RT provides extremely high absorbed dose gradients within a patient's body. Therefore, to detect a distribution of the dose, a linear size of the detector should fit the scale from 100 nm to a couple of micrometres.

Because RT aims to destroy DNS in which a single unit is sized to a nanometric scale, ND is of radiobiology importance.

When the high dose gradient is provided a thin film detector or thin surface layer of the solid material could be used for dosimetry.

If 3D nano-volume is of the interest, the nano-dotted/particle originated detector is possible to employ.

Weak electron near threshold photoemission (PE) is considered for readout of the dose absorbed by the nano-sized detector. The application of PE for ND is connected with the nanometric mean free path of the emitting electron.

PVDF nanofilms, the surface of a crystalline Si, PbS nanodots and diamond nanoparticles are considered for ND.