



Contribution ID: 64

Type: **WG3 Radiation Damage - Extreme Fluence**

## Variations of carrier lifetime in silicon under different reactor neutron irradiation regimes

*Tuesday 3 June 2025 14:20 (20 minutes)*

Carrier recombination lifetime in semiconductor material is a key parameter influencing the performance of radiation detectors. This property is highly sensitive to the presence of radiation-induced defects, which act as recombination centres and significantly alter carrier lifetime. However, the nature and concentration of these defects can vary depending on the specific irradiation conditions, and differences may arise not only between distinct irradiation facilities but also within different regions of the same reactor or particle accelerator chamber.

In this study, the carrier recombination dynamics in high-resistivity p- and n-type silicon samples subjected to neutron irradiation at fluences exceeding  $10^{17} \text{ cm}^{-2}$  were investigated. The samples were irradiated in the Ljubljana TRIGA reactor in different channels. Carrier lifetime measurements were performed by the contactless microwave probed photoconductivity transients technique and the pump-probe setup by employing femtosecond laser pulses. In this talk, carrier recombination characteristics in Si under different reactor neutron irradiation regimes will be considered.

### Type of presentation (in-person/online)

in-person presentation

### Type of presentation (I. scientific results or II. project proposal)

I. Presentation on scientific results

**Author:** CEPONIS, Tomas (Vilnius University)

**Co-authors:** GAUBAS, Eugenijus (Vilnius University (LT)); Dr PELLEGRINI, Giulio (Centro Nacional de Microelectrónica (IMB-CNM-CSIC) (ES)); MANDIC, Igor (Jozef Stefan Institute (SI)); ZILINSKAS, Kestutis (Vilnius University (LT)); DEVEIKIS, Laimonas (Vilnius University (LT)); RUMBAUSKAS, Vytautas (Vilnius University (LT))

**Presenter:** CEPONIS, Tomas (Vilnius University)

**Session Classification:** WG3/WP3 - Extreme fluence and radiation damage characterization