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

Hunting the X-Defect

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This contribution presents new insights into the elusive “X-defect”, observed in Thermally Stimulated Current (TSC) measurements as a low-temperature shoulder to the BiOi defect in irradiated silicon diodes. Despite repeated observations, this defect has so far eluded assignment to a specific chemical structure.

A low-resistivity ($10\ \Omega\text{cm}$) p-type epitaxial silicon diode, irradiated with 5.5 MeV electrons, was investigated. Simulations were employed to reproduce TSC spectra using defect parameters obtained from Deep-Level Transient Spectroscopy (DLTS), allowing comparison and validation across both methods.

Double-DLTS measurements revealed that the underlying field-enhanced emission mechanism of the X-defect is a phonon-assisted tunneling process. This identification supports the assignment of the X-defect to the di-vacancy in the donor charge state $V_2(0/+)$, providing a strong candidate for its chemical structure.

Type of presentation (in-person/online)

in-person presentation

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

I. Presentation on scientific results

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