



Contribution ID: 37

Type: **not specified**

## The A<sub>Si-Si<sub>i</sub></sub>-defect - a possible candidate to explain acceptor removal in LGADs

*Tuesday 21 June 2022 10:10 (20 minutes)*

Experimental evidence for the explanation of light-induced degradation (LID) in silicon by the A<sub>Si-Si<sub>i</sub></sub>-defect is summarized [1, 2]. Based on these findings, a possible involvement of the B<sub>Si-Si<sub>i</sub></sub>-defect in the acceptor removal phenomenon of low-gain avalanche detectors (LGAD) [3] with a boron-doped gain layer is discussed. An outlook on density functional theory (DFT) based calculations of the A<sub>Si-Si<sub>i</sub></sub>-defect configurations and energy barriers in-between is given.

[1] K. Lauer, C. Möller, D. Schulze, and C. Ahrens, "Identification of photoluminescence P line in indium doped silicon as InSi-Sii defect," AIP Advances, vol. 5, no. 1, p. 017101, Jan. 2015, doi: 10.1063/1.4905066.

[2] K. Lauer, C. Möller, C. Tessmann, D. Schulze, and N. V. Abrosimov, "Activation energies of the InSi-Sii defect transitions obtained by carrier lifetime measurements," physica status solidi (c), vol. 14, no. 5, p. 1600033, 2017.

[3] K. Lauer, K. Peh, S. Krischok, S. Reiß, E. Hiller, and T. Ortlepp, "Development of low gain avalanche detectors (LGAD) in frame of the acceptor removal phenomenon," physica status solidi (a), doi: 10.1002/pssa.202200177.

**Primary author:** Dr LAUER, Kevin (CiS Institut fuer Mikrosensorik GmbH (DE) / TU Ilmenau (DE))

**Co-authors:** FLÖTOTTO, Aaron; PEH, Katharina; BEENKEN, Wichard; KRISCHOK, Stefan; ORTLEPP, Thomas; RUNGE, Erich; SCHULZE, Dirk

**Presenter:** Dr LAUER, Kevin (CiS Institut fuer Mikrosensorik GmbH (DE) / TU Ilmenau (DE))

**Session Classification:** Defect and Material Characterization