WG3: Discussions

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1st DRD3 Workshop
Working group 3 (WG3) Session
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WG3 Research Goals

WG3 research goals <2027	
	Description
RG 3.1	Start of building up data sets on radiation-induced defect formation in WBG materials
RG 3.2	Continue developing silicon radiation damage models based on measured point and cluster defects
RG 3.3	Provide measurements and detector radiation damage models for radiation levels faced in HL-LHC operation
RG 3.4	Expand the measurements and models of silicon and WBG sensors properties in the fluence range 10^{16} to $1 \cdot 10^{18}$ n_{eq}/cm^2

WP3 task, milestones, deliverables

WP	Task	MS or D	Description	2024	2025	2026	2027-2029	> 2030
2	2.2, 3.3	D2.4	Production of LGAD with radiation resistance up to $1{\cdot}10^{16}$ n_{eq}/cm^2				x	
3	3.3.	MS3.7	Fabrication and testing of different defect engineered Si sensors (enrichment with O, C and/or P) mimicking the gain layer in LGADs	x				
3	2.2, 3.3.	MS3.8	Understanding the effect of co-doping with O, C and/or P on the radiation hardness of gain layers in LGADs and develop defect engineered strategies for improving the radiation hardness (pin diodes 2026) and then segmented detectors (2029).			x	x	

WP3 task, milestones, deliverables

WP	Task	MS or D	Description	2024	2025	2026	2027-2029	> 2030
3	3.3	D3.4	Report on microscopic and macroscopic investigations in irradiated defect engineered gain layers for Si based LGADs			x		
3	3.3	D3.5	Radiation damage studies on various silicon sensors up to $1{\cdot}10^{17}$ n_{eq}/cm^2 (2025) and up to $1{\cdot}10^{18}$ n_{eq}/cm^2 (2029)		x		x	
3	3.1	MS3.4	Understanding timing performance and validate simulation models of SiC detectors, before irradiation (2024) and at $1{\cdot}10^{15}$ n_{eq}/cm^2 (2030).			x		x
3	2.2, 3.1	MS3.5	SiC-LGAD (gain layer) proof of principle, simulation and first fabrication of devices with small areas (< 1 cm^2 in 2026) and in large areas (5 cm^2 after 2030).			x		x
3	3.1	MS3.6	Assess GaN devices as high-rate, high timing precision devices			x		

- 3rd WG3 convenor still missing
- Identify common DRD3 projects
- WG3 Organisation:
  - No subgroups for the time-being
  - Do we need liaison persons for:
    - Simulation (WG4)?
    - WBG (WG6)?
    - LGAD (WG2)?
    - Irradiations?
  - Regular meetings in between the DRD3 workshops

Important e-mails:

- Convenors: drd3-wg3-conveners@cern.ch
- E-group: drd3-wg3-radiation