

High fluence effects on silicon detectors: damage and defects characterization

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The CERN RD50 collaboration has the aim to investigate radiation hard semiconductor devices for very high luminosity colliders. This is done by looking into four key aspects: Defect/material characterization, detector characterization, new structures and full detector systems.

After the Phase II upgrade of the Large Hadron Collider (LHC) the luminosity will increase and therefore the radiation level for the silicon detectors. They have to be able to operate at fluences of up to $2E16$ neq/cm². To cope with this, new semiconductor sensor technologies have been developed within the RD50 collaboration. This talk will give a brief overview of those, which include:

3D detectors, HV-CMOS pixel detectors, low gain avalanche detectors (LGAD) and sensors with slim/active edge.

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