Contribution ID: **24** Type: **not specified**

Radiation Damage in Silicon Detectors

Monday, November 6, 2017 2:00 PM (1 hour)

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Abstract: Radiation damage in silicon detectors used in high energy physics experiments is reviewed. Starting from basic silicon properties, effects of irradiation in hadron collider experiments are presented. Particle fields in detectors are examined in terms of ionization dose (TID) and especially non-ionizing energy loss (NIEL) responsible for displacement damage. A historical overview of silicon detector capabilities to cope with ever increasing radiation levels is given, with the paramount role of the CERN RD 48 and RD50 collaborations.