Radiation Hardness of Solid State Tracking Detectors
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The key devices for the reconstruction of charged particle tracks in the LHC Experiments are silicon detectors. In order to distinguish between primary and secondary vertices and in order to achieve a good track resolution they are placed very close to the interaction points. Consequently, they have to operate in extremely intense radiation fields causing severe deterioration of the detector performance.
The lecture will give an overview about the radiation fields in the LHC Experiments, outline the main mechanisms leading to the radiation induced degradation of the detector performance and present the limitations of the presently installed detectors in terms of radiation tolerance. Furthermore, an overview will be given about R&D strategies and activities aiming to develop radiation hard detectors for the LHC upgrade (Super-LHC) which will have to face a further increase in particle fluence by a factor of about 10.