

Development of ultra-radiation-hard tracking detectors for SuperLHC

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The future upgrade of luminosity of the Large Hadron Collider up to $10^{35}\text{cm}^{-2}\text{s}^{-1}$ will pose severe requirements to silicon tracker detectors due to increased fast hadron fluences up to $10^{15}\text{-}10^{16}\text{cm}^{-2}$. An intense research activity is presently carried on by the High Energy Physics community in view to increase the radiation hardness of state-of-art semiconductor detectors to this fluence range. A review concerning most promising semiconductor materials and effective device engineering solutions will be given. Experimental results, recently achieved with planar devices made with different silicon materials (Czochralski, Float Zone, Epitaxial) are here presented and discussed, especially focussing on the research activity performed in the framework of the RD50 CERN Collaboration.