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The RD50 Activity in the Context of Future Pixel Detector Systems

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The CERN/RD50 collaboration is dedicated to the radiation hardening of semiconductor sensors for future super-collider needs. It is therefore natural that the findings of our collaboration in this field are relevant to the pixel devices for the LHC experiment upgrades. A summary of the consistent amount of results on radiation tolerance enhancement of silicon sensors from RD50 will be presented. Moreover, the research towards radiation hardening has highlighted, and increased knowledge on properties of sensors that are relevant to other applications. For example radiation hardening relies on the speed of signal collection in irradiated devices. As a consequence, the methods envisaged for increasing this collection speed turn out to be promising for significantly enhancing the performance of time resolved, high spatial resolution systems. Another technology strongly emerging for future pixel sensor systems is HV-CMOS. RD50 results provide relevant information for this technology regarding the behaviour of the deep collecting electrode (deep n-well) for this type of devices after irradiation. Moreover, the methodology we have developed for the radiation tolerance studies could be a very good framework for comparing the new devices with the current state of the art.

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