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Sensor concepts for future hybrid pixel detectors

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Hybrid pixel detectors which will be operated in experiments after the luminosity upgrade of LHC, have to survive very high radiation doses up to 10^{16} $1\text{MeV } n_{eq}$ per cm^2 . Therefore, new sensor concepts exceeding the radiation tolerance of the currently used DOFZ planar n-in-n silicon sensors are under investigation. Among them are 3D active edge silicon detectors, single crystal or polycrystalline chemical vapor deposition (CVD) diamonds or n-in-p planar processed silicon detectors on MCz or EPI p-type bulk material. These sensor concepts will be presented and their prospects will be discussed using the experience gained with prototype devices which were bump bonded to ATLAS pixel front-end electronics. Recent results coming from lab measurements or test beams will be shown.

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