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Signal height in irradiated Silicon Pixel Detectors

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In order to establish a fluence limit for the radiation hardness of the CMS barrel pixel detector and for conventional n-on-n sensors in general, pixel sensors of the size of one CMS pixel readout (PSI46V2.1) have been bumpbonded and irradiated with positive pions up to 6E14 Neq/cm2 and with protons up to 4E15 Neq/cm2. The sensors were taken from production wafers of the CMS barrel pixel detector. They use n-type DOFZ material with a resistance of about 3.7 k Ohm cm and an n-side read out. As the performance of silicon sensors is limited by trapping, the response to a Sr-90 source was investigated. The highly energetic beta-particles represent an approximation to minimum ionizing particles. The bias dependence of the signal for a wide range of fluences will be presented.

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