

Time resolution of an irradiated 3D silicon pixel detector

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We report on the measurements of time resolution for double-sided 3D pixel sensors with a single cell of $50 \mu\text{m} \times 50 \mu\text{m}$ and thickness of $285 \mu\text{m}$, fabricated at IMB-CNM and irradiated with reactor neutrons to $8 \times 10^{14} \text{ MeV n}_{eq}/\text{cm}^2$ and then to $2.3 \times 10^{15} \text{ MeV n}_{eq}/\text{cm}^2$. Measurements were conducted using a radioactive source at a temperature of -20 and $20 \text{ }^\circ\text{C}$ in a bias voltage range of $50\text{-}300 \text{ V}$. The reference time was provided by an LGAD detector produced by Hamamatsu.

In order to reduce the effect on jitter a detector has been produced and tested with the same technology but with a thickness of $235 \mu\text{m}$. The results obtained are compared to measurements conducted prior to irradiation.

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