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A new 3D PIN diode structure for neutron detection

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A new hybrid structure of a 3D silicon sensor coupled to a scintillator for the detection of fast and thermal neutrons is presented. The device is based on a PIN diode with DRIE-etched cavities filled with polysiloxane acting as a scintillator, while the signal is transferred to the other side by means of TSV. The structure increases the active interaction volume for neutron, with respect to a planar device, giving higher detection efficiencies. We present the fabrication process and some selected results from the electrical characterization of devices and test structures.

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