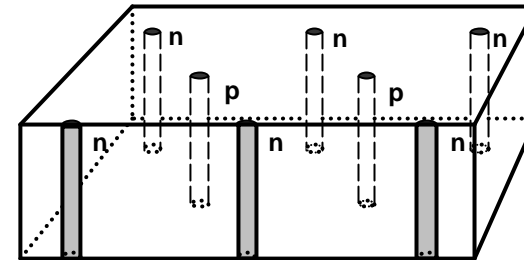


Silicon Radiation Sensors with Three Dimensional Electrode Arrays

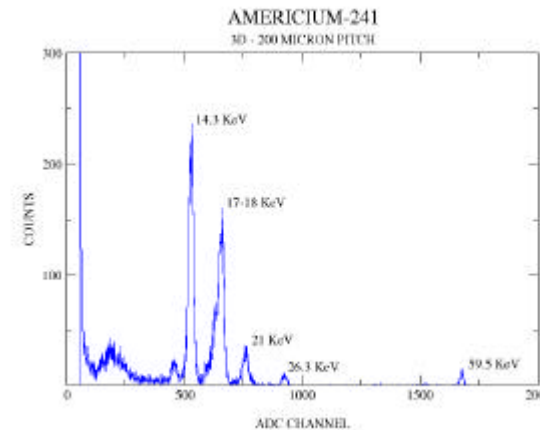
1. Detects ionization in Intrinsic silicon that has been depleted of normal mobile charge carriers by back-biased P⁺ and N⁺ electrodes BUT
2. Unlike normal planar PIN diodes with electrodes confined to the silicon surfaces, these penetrate through the substrate, and can be closely spaced.
3. This provides order-of-magnitude faster signals and order-of-magnitude greater resistance to the damaging effects of bulk radiation damage.
4. In addition, the fabrication technology allows the edges to be made into electrodes, eliminating the large dead region around the saw-cut edges of standard planar diodes.
5. This active-edge technology permits large areas to be covered with modest size sensors that can be made with high yield, and without dead bands along their borders, something of great importance in medicine and biology.

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Trans. Nucl. Sci. 46 (1999) 1224; 48 (2001) 189,1629;
See authors for page proofs of preliminary paper on active edges.



Simplified Cross Section of Part of Sensor



Am²⁴¹ Spectrum Recorded With 3D Sensor