

## Development of a two-dimensional readout micro-strip sensor with single-sided silicon processes

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### Abstract

A two-dimensional readout micro-strip sensor with single sided silicon process has been designed and fabricated. Both p+ and n+ electrodes are implemented on one side, so that the field is developed parallel to surface at first, then developed gradually toward the other side. The n+ electrode is surrounded by the p+ implant to make isolation of each n+ electrode. The p+ implant strip is isolated by a small gap between both side neighbor strips. The n+ electrodes are connected and the signal is readout by a readout strip running perpendicular to the p-strip. The n+ strip is printed on silicon oxide (SiO<sub>2</sub>) layer isolated from the p-strips implemented underneath of the SiO<sub>2</sub>. The test chip has been fabricated at HPK. The detector properties have been measured and basic idea has been proofed. However, a starting voltage of the breakdown is not sufficiently high to achieve deep depletion underneath the n+ electrode due to thin isolation SiO<sub>2</sub> layer between p and n readout-strip. The electric field generated at the crossing point of p and n readout strip is expected to be high to make micro-discharges. This weak point is expected with this process due to thin isolation SiO<sub>2</sub> layer. Next attempt should improve this weak point.

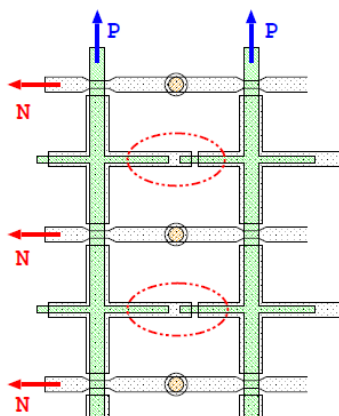


Fig.1 A strip structure of 2-D sensor

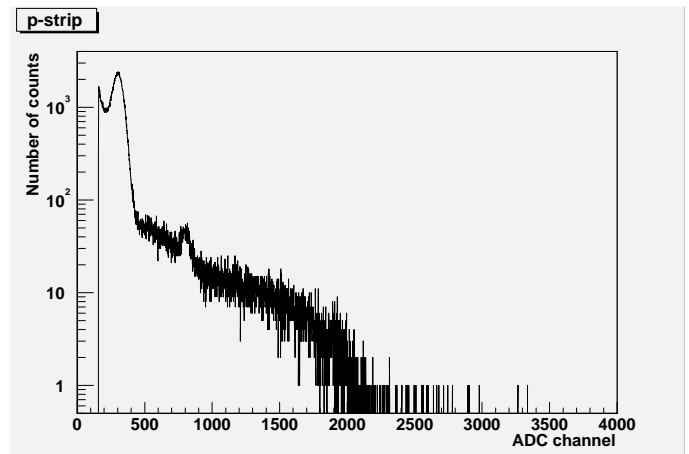


Fig. 2 X-ray spectrum for <sup>133</sup>Ba taken from a p-strip by applying 40V potential.