

# Recent results of measurements of annealing effects in irradiated Hamamatsu p-type microstrip detector with SCT128 chip

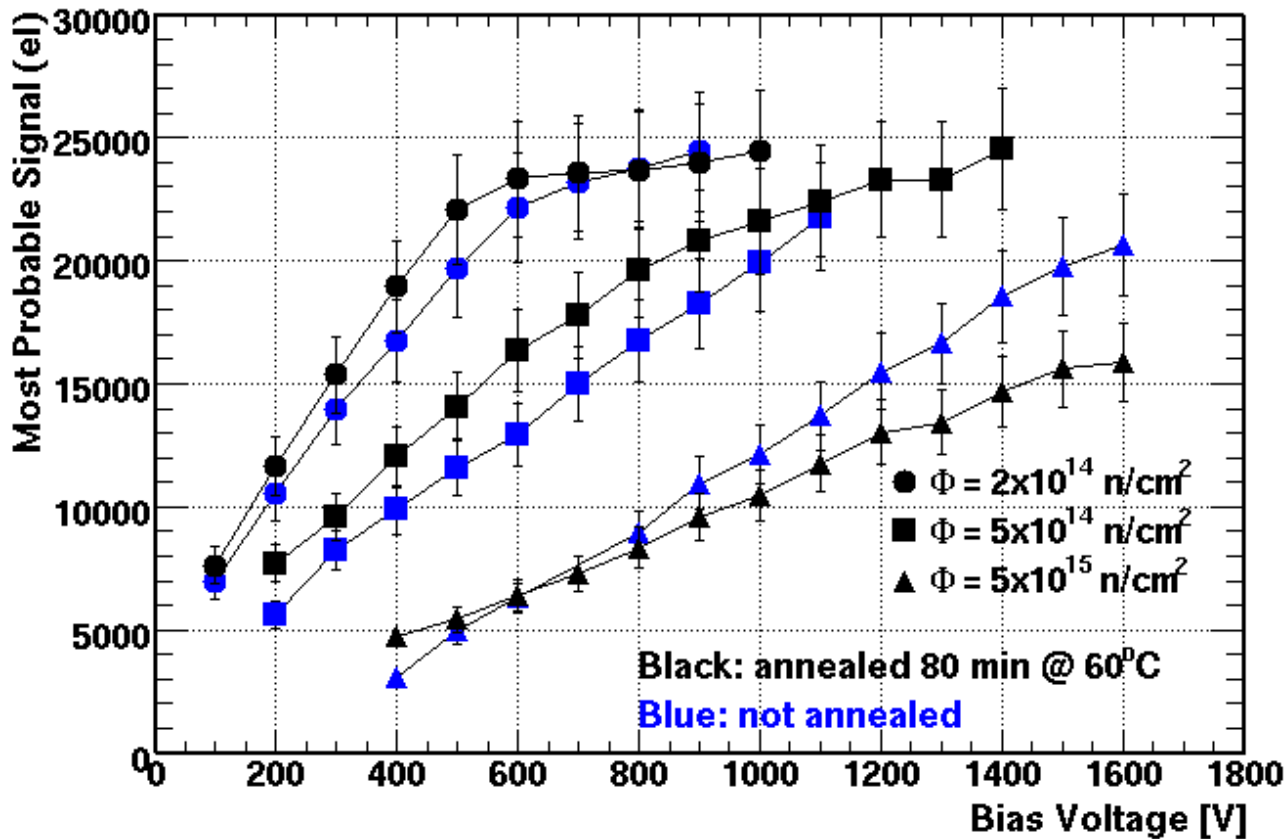
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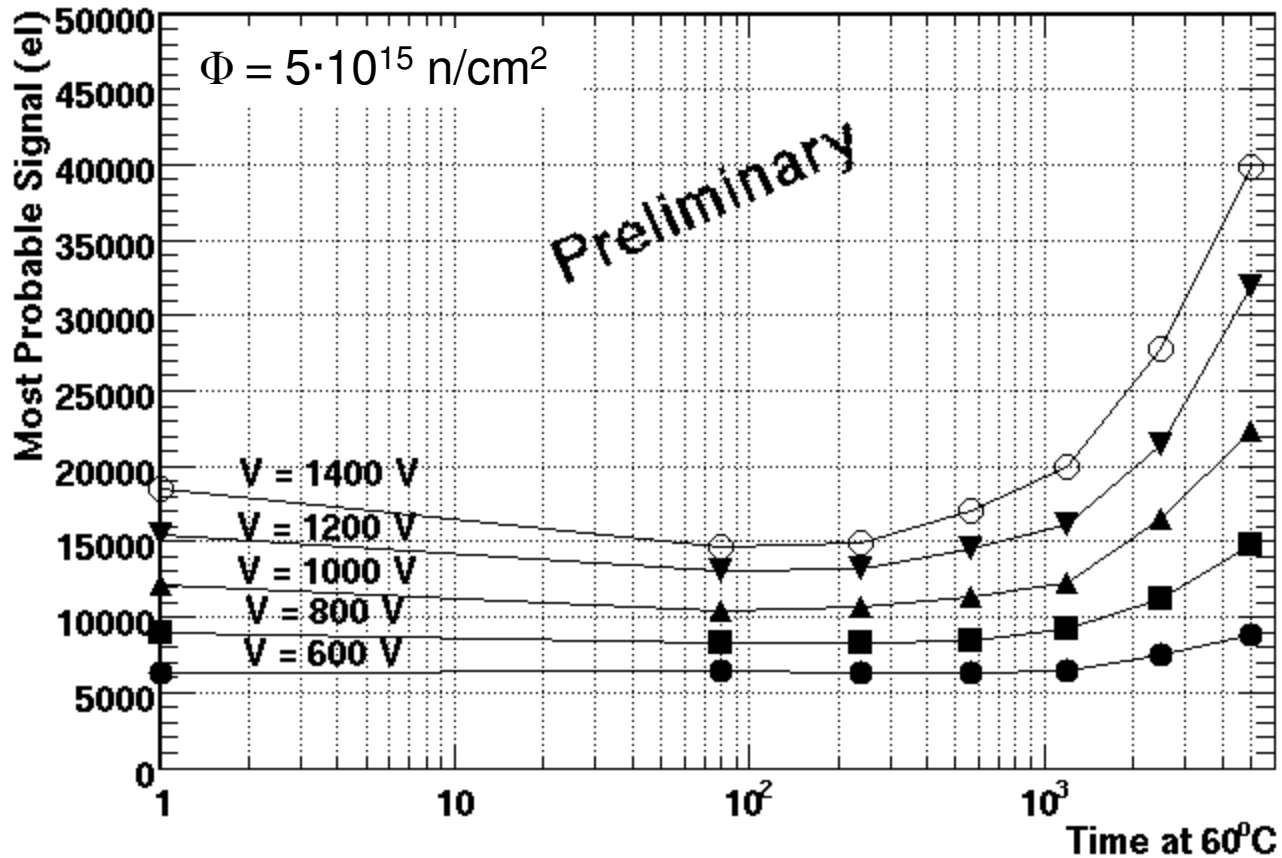
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- miniature microstrip Hamamatsu detectors from ATLAS strip upgrade project
- FZ, p-type, 320  $\mu\text{m}$  thick, 75  $\mu\text{m}$  pitch, 1x1  $\text{cm}^2$  (ATLAS07A, Z3, W44)
- detectors irradiated with neutrons in Ljubljana reactor
- signals from  $^{90}\text{Sr}$  electrons measured with SCT128 chip

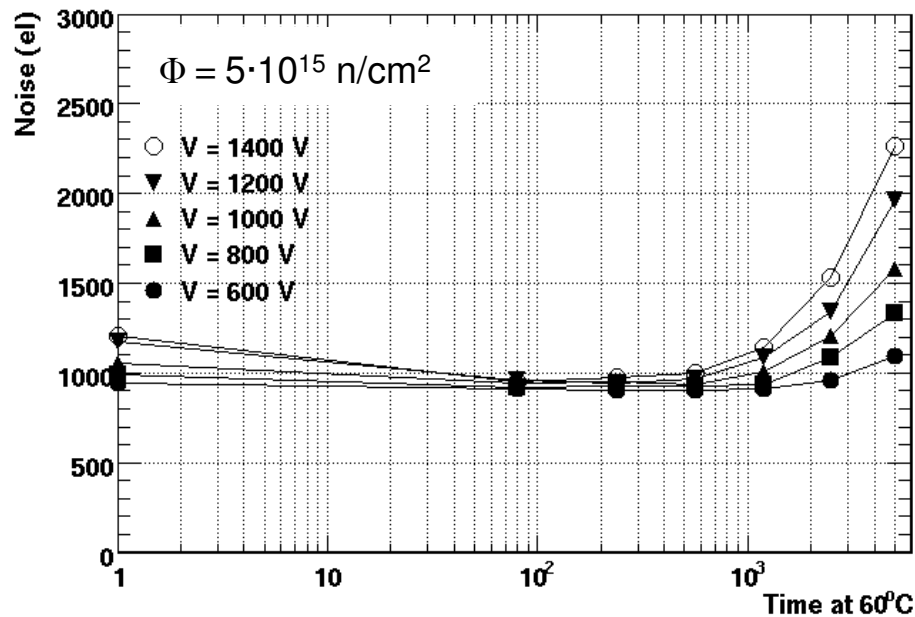


- more annealing steps with detector irradiated to  $5 \cdot 10^{15} \text{ n/cm}^2$
- large rise of collected charge with annealing time at high bias voltage

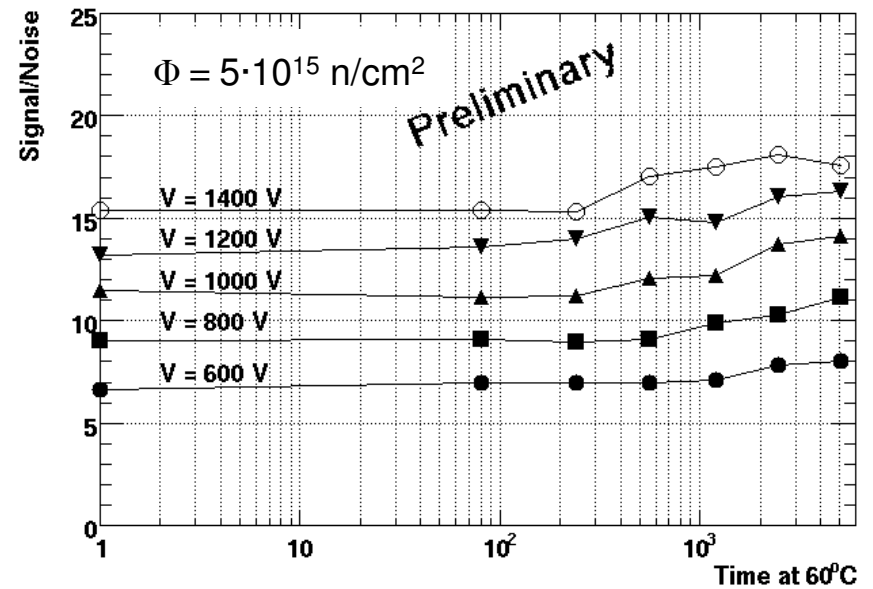


- noise increases with annealing time
- ratio signal/noise constant

Noise:

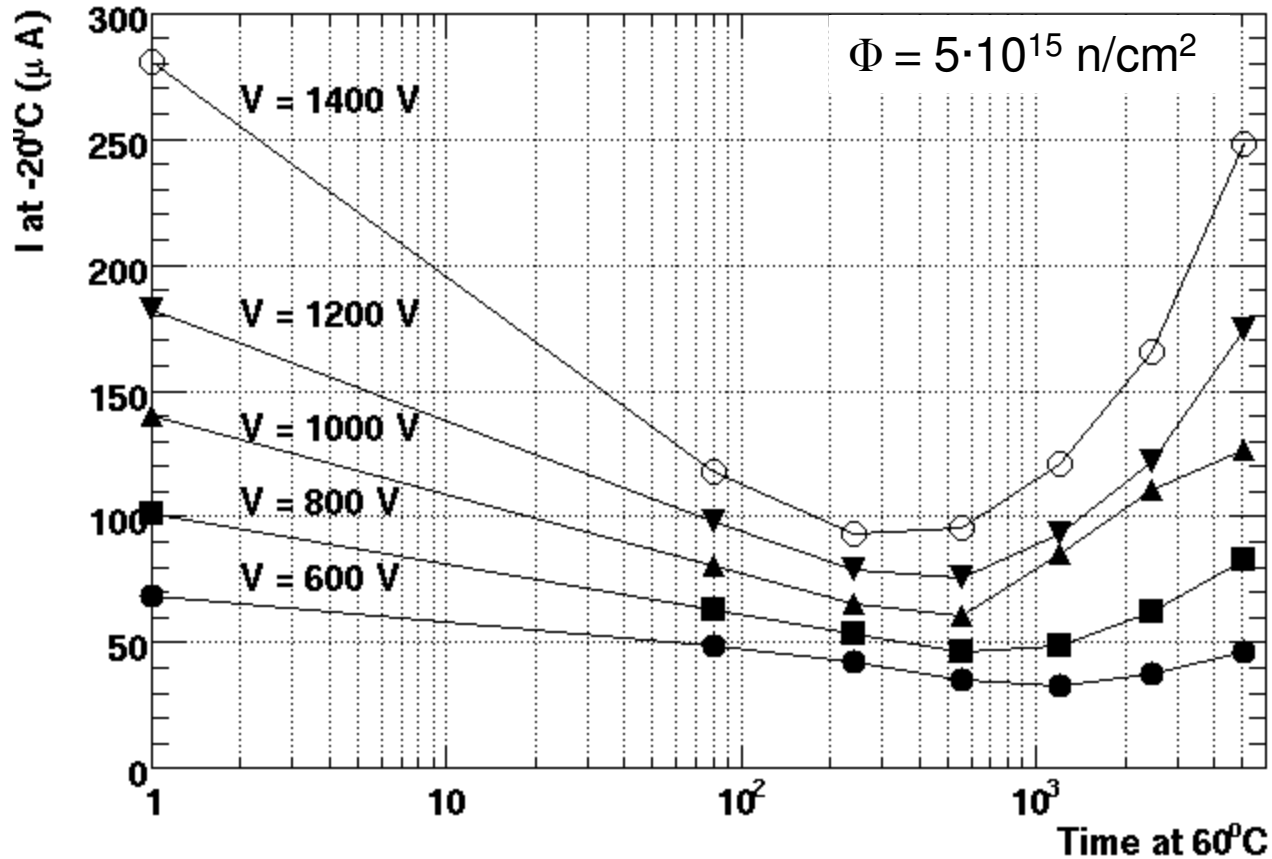


Signal/Noise:



- leakage current
  - ➔ large increase of current with annealing time at high bias voltage
  - ➔ increase of noise larger than expected from increase of leakage current

Current (guard ring not connected) at  $-20^{\circ}\text{C}$



## Conclusions

- unusual annealing behavior measured with detector irradiated to  $5 \cdot 10^{15}$  n/cm<sup>2</sup>
- it looks as if multiplication effects amplify with annealing:
  - measured charge increases
  - current increases
- measurements with different method on different detector confirm the hypothesis  
→ measurements on Micron detector with Edge-TCT presented by Marko

Future work:

- confirm measurements with another detector with new SCT128 chip

