

## Testing ultra-thin silicon epitaxial strip detectors

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### STATE OF THE ART (NEW) TECHNIQUE AND ENHANCED POSSIBILITIES

A new technique was recently developed at the Institute of Electronic Materials Technology in Warsaw for narrow silicon epitaxial detector strips as low thickness as 25µm and 5µm [1] under the leadership of A.J.Kordyasz.

Such detectors with dimensions 5µm thick, 9mm long and 1mm wide strip were already tested. The electronic noise is around 50 keV, measured through a calibrated capacitor.

In order to measure light particles such as protons and alphas of low energy, the electronic noise has to be reduced to 20 keV [1] already in perspective by the author.

The detector thickness nonuniformity was checked and proved to be less than ±5%.

### OUR PROPOSAL

In Nuclear Astrophysics experiments with charged particles as output from the nuclear reaction, the energies are relatively low. To measure and discriminate between particles with a good resolution, such thin detectors are extremely useful.

We plan to use these thin detectors in next applications for Nuclear Astrophysics experiments such as  $^{19}\text{F}(\alpha, p)$  or  $^{12}\text{C}(^{12}\text{C}, x)$ .

Because these detectors are not commercially manufactured, each such detector has to be checked and characterized before introducing them in an experimental setup. This is the purpose of our application.

### ACTIVITIES

For the future we have to

- develop proper home-made preamplifiers
- check the detectors behavior by running a test experiment  $^{12}\text{C}(^{12}\text{C}, x)$  at the 3MV accelerator in the beam-energy range 3-8 MeV.

[1] Acta Physica Polonica B 47 (2016) 797