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## PS2-16: Results of Testing for Energy Dispersive Si Detector with Large Working Area

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In the recent papers about the experimental study of parametric X-ray radiation (PXR) generated in the silicon crystal by the extracted proton beam with energy 50 GeV at the accelerator U70 PXR was observed by energy dispersive detector XR-100CR made by Amptek with sensitive surface area of  $6 \text{ mm}^2$  [1, 2]. Later on because of the wide angular distribution of PXR, in order to increase the accuracy of measurements of the PXR yield it was proposed to use energy dispersive spectrometer with a large area of the sensitive surface (more than  $130 \text{ mm}^2$ ) developed by Tomsk Polytechnic University jointly with the Petersburg Nuclear Physics Institute. However, in these experiments, the spectrometer went out of order at each pass of the beam through the target. The problem was solved by moving the detector to a considerable distance from the beam. However, even at large distances the detector was continuously overloaded due to the strong background radiation.

Analysis of the experimental results obtained at the U70 accelerator revealed the necessity of the preamp upgrading. Continuous feedback was replaced to resistive that resolved the problem of detector switch off at its overloading, and allowed increasing the counting rate up to  $10^5 \text{ p/s}$  as well as improving the resolution at high counting rates.

In this work we would like to present the testing results for the spectrometer with a large area of the sensitive surface after its upgrading. Tests were carried out at the XLab Frascati LNF laboratory. The main aim of the research was to study the shape of the surface radiation detection efficiency. According to the results obtained the detection efficiency is uniform with high accuracy throughout the sensor area.

### References

1. Afonin A.G., Britvich G.I., Chesnokov Y.A. et al. Observation of parametric X-ray radiation excited by 50 GeV protons and identification of background radiation origin // Problems of Atomic Science and Technology. - 2013. - Issue 4. - p. 315-319.
2. Afonin A.G., Britvich G.I., Chesnokov Y.A. et al. Observation of parametric X-ray radiation from protons with energy 50 GeV // Russian Physics Journal - 2013 - V. 56 - №. 11/2. - p. 178-183 (in English).

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