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## **Silicon micro-strip detector for imaging of fast processes at high intensity synchrotron radiation beam**

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### **Content**

The technique of imaging of fast processes at high intensity synchrotron radiation (SR) beam is developed in the Budker Institute of Nuclear Physics since the beginning of 2000s. The DIMEX (Detector for Imaging of Explosions) based on gas ionization chamber is working at the channel 0 at the VEPP-3 storage ring and at the channel 8 at the VEPP-4M storage ring. However, the gaseous detector can not provide the necessary parameters for the experiments at the channel 8 at the VEPP-4M, where photon flux is up to 100 times higher than at the channel 0 at the VEPP-3. In particular the rate capability of gaseous detector is far not enough due to the space charge effects induced by slow positive ions. The Si micro-strip detector is proposed for high rate experiments at the VEPP-4M storage ring. The first Si sensors were produced by Hamamatsu Photonics and included 1024 p-strips on n substrate with DC metal strips. The strip pitch is 50  $\mu\text{m}$  and the strips length is 30 mm. Each metal strip is connected to the guard ring through  $\sim 400$  Ohm polysilicon resistor in order to drain high current from the sensor to ground. The front-end electronics will measure the voltage drop on such resistor. A dedicated ASIC is developed for this detector that is able to measure signals from each strip in the range equivalent to 1000 to  $10^6$  photons with 30 keV energy and store them in the analogue memory with the frame rate up to 50 MHz. The first prototype of such detector that will include 120 channels equipped with the prototype ASICs is assembled now and the first results of the measurements will be shown in the presentation.

### **Summary**

**Primary author(s) :** Mr. SHEKHTMAN, Lev (Budker Institute of Nuclear Physics)

**Presenter(s) :** Mr. SHEKHTMAN, Lev (Budker Institute of Nuclear Physics)

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