



# Beam profilometer for BM@N

Danil Chemezov on behalf of Forward Silicon Detector team

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### Beam profilometer for light ions (C ÷ Ar)







### New beam profilometer for heavy ions (Xe, Au, Bi)



× 61) mm<sup>2</sup> (same detector as for SiBT). Strips are combined in pairs on detector board. Total have (64p<sup>+</sup>×64n<sup>+</sup>), pitch = 950 µm; Predicted coordinate resolution is 274 µm

**Dynamic range of signals: -35pC ÷ +25pC**. Charge of ionization for heavy ions Xe(10.8 pC/175 µm-Si), Au (20.9 pC/175  $\mu$ m-Si), Bi) corresponded of  $\Delta$ E-signals (240÷500 MeV/175 µm-Si). Peaking time 500 ns. Self trigger mode based on TA32cg2 ASICs



### Conclusions



- The detector for new heavy ion beam profilometer is DSSD (128p+×128n+) with strips pitch = 475 μm, thickness (Si) -175 μm, active area (61 × 61) mm2 (same detector as for SiBT). Strips are combined in pairs on detector board. Total have (64p<sup>+</sup>×64n<sup>+</sup>), pitch = 950 μm, predicted coordinate resolution is 274 μm;
- FEE for beam profilometer is based on two VA32HDR11 ASICs. Total number of channels are 64 for X and 64 for Y coordinate. Dynamic range of signals: -35pC ÷ +25pC;
- Work in progress to modify and test the standalone DAQ for the new version of the detector and FEE;
- If necessary, 3 SiBT stations can be used as a profilometer (with DAQ BM@N running)





## Backup



### Silicon detectors upstream of the target at BM@N experiment (for Xe-run 2022/2023)





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#### **Standalone DAQ for beam profilometer (for light ions)**





FEE for Beam profilometer:

- autonomous measurement system (without connection to BM@N DAQ);
- display information in the form of a 2D image and amplitude information;
- self-trigger counter = ion beam intensity;
- universal Readout board with changeable Mezzanine boards.

### Standalone DAQ for beam profilometer (for light ions)



FEE for Beam profilometer DSSD:

- based on Xilinx Zynq SoC;
- configure ASICs by external trigger;
- capture ADC data and
- analyze;

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- pedestal subtraction and zero
- suppression;
- send via Ethernet.

