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# Development of the Fast Interaction Trigger for MPD experiment

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The fast triggering of nucleus –nucleus collisions and the precise TOF measurement with picosecond time resolution are important features of all experiments at RHIC and LHC colliders.

The Fast Interaction Trigger (FIT) system is an important part of the Multi-Purpose Detector (MPD) setup for study of Au + Au collisions with beams of NICA collider in the energy interval  $4 \leq \sqrt{s_{NN}} \leq 11$  GeV. The main aims of the FIT are (1) fast and effective triggering of Au + Au collisions in the center of the MPD setup and (2) generation of the start pulse for the TOF detector.

The fast vertex-trigger signal, provided by Fast Forward Detector (FFD), is the main signal of the L0 trigger of MPD. The fast determination of z-position of collision point of the vertex requires the appearance of pulses with high amplitudes in both sub-detectors FFDe (East side) and FFDw (West side) and it defines the trigger efficiency. For this aim the pulses of each sub-detector are fed to sub-detector electronics unit. Two-threshold method is used to get a good time resolution, only LVDS pulses with lengths above a threshold value (corresponding to photodetector output pulses with large amplitudes) are used for production of sub-detector pulses Te and Tw. The time of generation of these pulses is defined by appearance of the first good pulse from sub-detector modules.

This presentation will cover the main design concepts, detector construction, beam test results, and the results of detector performance studies.

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