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Status report on the SPD Beam-Beam Counter (BBC) prototype for initial SPD runs at NICA

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This study addresses the design and prototyping of the Beam-Beam Counter (BBC) subsystem for the SPD experiment. The proposed prototype features a modular structure of 16 sectors, with a total number of tiles equal to 128, as well as a dedicated configuration for integration into the Phase 0 of SPD experimental setup. To validate its performance, two reduced sectors were tested in fixed-target mode using $^{124}\text{Xe}+\text{Ag}$ collisions at 2.2 GeV/nucleon on the internal target station (ITS) of the Nuclotron. The full DAQ chain based on the FERS5200 system was successfully validated under operational beam conditions both in triggered and triggerless modes. These results establish a critical benchmark for the commissioning of the proposed prototype and are directly relevant to upcoming Phase 0 measurements of the SPD/NICA project.

Primary author(s) : TISHEVSKY, Aleksey

Co-author(s) : FOMICHEV, Nikita; ET AL.

Presenter(s) : TISHEVSKY, Aleksey

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