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Development of beam trigger detectors for the BM@N experiment

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A system of beam detectors for fast analysis of beam ions and projectile spectators in the BM@N experiment was developed and applied in the 2023 BM@N run with ^{124}Xe ions at energy of 3.8 A GeV and beam intensity up to 10^6 ions per burst. The basic elements of the detectors are thin scintillators with thickness from 0.15 to 0.5 mm and special PMTs operating in the strong magnetic field of the BM@N magnet. The detectors provide good pulse height resolution and picosecond timing. The main aim of the system in the BM@N experiment is active control of beam ion transport through the experimental area providing a set of different triggers for data taking including the minimum bias trigger which selects interactions in the target. The design and characteristics of the detectors are presented as well as their performance in the run. Upgrade plan for future runs is discussed.

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