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New beam position detectors for NA61/SHINE experiment

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NA61/SHINE is a multi-purpose fixed-target experiment located at the Super Proton Synchrotron at CERN. The main goals of the experiment include studies for physics of strong interactions, neutrino physics, and cosmic-rays physics. After the upgrade of the detector system, scheduled to be completed this year, the experiment will collect data up to 1 kHz event rate (factor 10 increase). The development of new beam position detectors, used to measure the positions of incoming beam particles in the transverse plane, is a crucial part of the upgrade. The previous set of beam position detectors was based on the proportional gas chambers.

Instead, two new kinds of beam position detectors are prepared and tested. One of them is the scintillating fibre detector with a multi-anode photomultiplier readout. It is built of two perpendicularly arranged ribbons, each consisting of two shifted layers of green-emitting scintillating fibres with a diameter of 250 μm. The second type of detector is based on the single-sided silicon strip detector (Hamamatsu S13804).

The talk will give an overview of both detectors' concepts and will present the results of tests and commissioning experiments.

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