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Subject: Abstract for talk at the 14th pisa conference frontier detectors for frontier physics

Posted by [Sebastian Zimmermann](#) on Mon, 12 Mar 2018 15:55:57 GMT

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Here is my abstract for the conference. I only have 1500 characters and at the moment it stands at 1487.

I would be glad about some feedback.

The barrel-Time-of-Flight subdetector is one of the outer layers of the multi-layer design of the PANDA target spectrometer. PANDA, which is being built at the FAIR facility, will study open questions in hadron physics by colliding antiprotons on a fixed Hydrogen or nuclei target with a variable antiproton momentum ranging from 1.5 to 15 GeV/c.

The barrel-TOF detector is designed to achieve a time resolution below 100 ps which allows for good event separation, needed for the free flowing data acquisition of the experiment, providing the interaction times of events as well as particle ID below the Cherenkov threshold.

The B-TOF is situated right in front of the barrel EMC and therefore is able to provide a preshower detection for the EMC. It is designed with a minimal material budget in mind mainly consisting of 5 mm thin plastic scintillator tiles read out by a serial connection of 4 SiPMs.

The signal transmission is embedded in 16 large (>1m) multilayer PCB in microstrip lines. These boards also provide the mechanical support to 2 x 60 scintillator tiles covering an azimuthal angle of 22.5° to 150°.

We will first review the the detector concept and design which is described in the TDR and some more recent developments, in particular in terms of signal transmission with a study of different PCB layouts, the readout with the TOFPET2 ASIC and its performance and presenting results of a study on the influence of the scintillator thickness on the time resolution.

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