The PWO-II Electromagnetic Calorimeter for the PANDA Target Spectrometer

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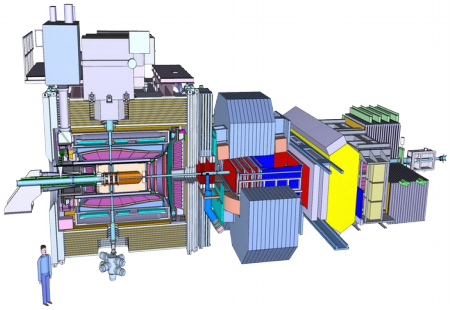

Fig. 1: The PANDA Experiment [1].

The future PANDA experiment with a next generation detector will focus on hadron spectroscopy. It will use cooled anti-proton beams with a momentum between 1.5 GeV/c and 15 GeV/c interacting with various targets. This allows to direct form all states of all quantum numbers and measure there widths with an accuracy of a few tens of keV [1]. The experiment will be located at the exceptional Facility for Anti-proton and Ion Research in Germany, which is currently under construction.

The electromagnetic target calorimeter of the PANDA experiment has the challenging aim to detect high energy photons with excellent energy resolution over the full dynamic range from 15 GeV down to a few tens of MeV within a 2T solenoid. To reach this goal, improved $PbWO_4$ scintillator crystals (PWO-II), cooled down to −25°C have been chosen. They provide a fast decay time for highest count rates, short radiation length for compactness, improved light yield for lowest thresholds and excellent radiation hardness.

The target calorimeter itself is divided into a barrel and two endcaps. The individual crystal will be read out with two precisely matched large area avalanche photo diodes. In the very inner part of the forward endcap vacuum phototetrodes will be used instead.

The talk will give an overview of the PANDA experiment and focuses on its calorimeter including the scintillator material and the production status. Furthermore, the construction and assembly procedure will be presented.

[1] The PANDA Collaboration, PANDA EMC Technical Design Report, arXiv:0810.1216v1