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The electromagnetic calorimeter of the PANDA experiment at FAIR.

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Summary

The electromagnetic calorimeter of the PANDA experiment at FAIR.

P. Rosier, IPN Orsay, for the PANDA collaboration.

The PANDA electromagnetic calorimeter will be installed on the HESR ring of the FAIR accelerator. Based on the CMS experiment, this calorimeter comprises 19040 lead-tungstate crystals on a nearly 4π coverage. The large dynamic range from several GeV down to a detection threshold of some MeV for EM radiation and the expected high background rate of neutrons and ions will impose severe requirements on crystals and light sensors. This paper presents the status of the R&D studies performed on different aspects: behaviour of PWO-II crystals and photo sensors especially on the radiation hardness, electronics development, particle rate simulations, mechanical design and integration of the cooling at -25°C stabilized at $\pm 0.1^{\circ}\text{C}$. All these informations rely on the construction and tests of a real-size prototype of 60 crystals. The writing of the EMC Technical Design Report is almost performed and presents the advanced level of the definition. The crystals production and quality control are in preparation and are foreseen to be in the continuity of the CMS production.

Primary author: Mr ROSIER, Philippe (IPN Orsay)

Presenter: Mr ROSIER, Philippe (IPN Orsay)

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