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CHARM – A fast, high resolution curved ^3He -based Multiwire-Proportional Chamber for the powder diffractometers DMC and ERWiN

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As part of the CHARM project, two large area ^3He -filled curved Multiwire Proportional Chambers (MWPC) covering 130° horizontal and 14° vertical acceptance have been designed and built by the MLZ detector group in collaboration with the Paul-Scherrer-Institut (PSI). Based on a concept of the Brookhaven National Laboratory, the detector consists of nine individual MWPC segments mounted seamlessly inside a common pressure vessel. Single wire/strip readout using a time-over-threshold based centre-of-gravity (CoG) algorithm is applied aiming at 0.115° angular resolution (FWHM) in both dimensions with 200 kHz global count rate capability per MWPC segment. Filled with 6.5 bar ^3He + 1.5 bar CF_4 the detector provides 75% detection efficiency for thermal neutrons.

At present, the two detectors are under commissioning at the FRM II detector lab and the instrument DMC at PSI, respectively. We will report on the production and tests of the detectors as well as results from the commissioning phase.

Primary author: ZEITELHACK, Karl

Co-authors: Dr HOWARD, Alan (MLZ); Mr GRAF, Dieter (PSI); DEFENDI, Ilario; Dr KELLER, Lukas (PSI); Dr HILDEBRANDT, Malte (PSI); Mr PANRADL, Max (MLZ); WIND, Peter; WILDGRUBER, Rudolf

Presenter: ZEITELHACK, Karl

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