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Performance of MEG II Positron Timing Counter Based on Commissioning Run Result

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We have developed a positron timing counter (TC) for the MEG II experiment which aims to search for $\mu^+ \rightarrow e + \gamma$ decay with the world's highest sensitivity.

The TC is segmented into 512 small scintillation counters with 6 SiPMs at the both ends. Since the positron time is measured by several counters (~ 9 on average), an excellent timing resolution is expected.

We constructed and installed a part of the final TC including calibration system with laser and performed an engineering run at piE5 beam line in PSI in 2015 winter and 2016 summer.

The positron timing measurement was success and we already achieved an excellent overall resolution of 31.5 ps with 10 hits as a preliminary result.

In this talk the expected final performance of TC based on the commissioning run will be discussed.

Furthermore, a developed analysis algorithm, contribution of a positron tracker, and laser calibration will be presented.

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