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## Neutron Lifetime Measurement at J-PARC/MLF/BL05

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The neutron lifetime ( $880.3 \pm 1.1$  [sec] [Particle Data Group]) is one of the most important parameters for the Big Bang Nucleosynthesis, which predicts nucleosynthesis in the early universe. So far it has been measured by two different methods, penning trap and UCN bottle, and they got recent value  $888.0 \pm 2.1$  [sec] and  $879.6 \pm 0.8$  [sec] respectively. Although both methods decide the lifetime at  $O(0.1)\%$  precision independently, there is a  $3.8$  sigma ( $8.4$  [sec]) discrepancy. Therefore we need new approaches which can resolve this problem. Our method, “Electron Counting”, is one of such approaches. In this method, we count the number of electrons which emitted by neutron beta decay using Time Projection Chamber (TPC). Not only counting electrons, we count the number of  $3\text{He}(n,p)3\text{H}$  reactions to determine neutron flux using same detector at the same time. Our method has different kinds of systematic uncertainties from previous two methods, thus our results directly contribute to resolve current discrepancy. We acquired the first physics data set at J-PARC/MLF/BL05 in 2016 spring. The statistical uncertainty is about  $O(10)\%$  precision on neutron lifetime. This talk will report the recent results of obtained data set.

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