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Search for Muon to Electron Conversion at J-PARC

We would like to present the status of the COMET experiment, which aims at searching for muon to electron conversion in a muonic atom at J-PARC with an experimental sensitivity of better than 10^{-16} . The muon to electron conversion is one of the processes of charged lepton flavor violation (cLFV). Physics of cLFV has attracted much attention from theorists and experimentalists since cLFV would have a potential to find a clue of physics beyond the Standard Model. In particular, muon to electron conversion in a muonic atom has been identified as a next-generation process to improve a sensitivity beyond the MEG at PSI. The aimed sensitivity with the COMET is a factor of 10,000 better than the present experimental limits. The COMET proposal has been approved at the stage-1 level at J-PARC, Japan in 2009, and the detailed design works and R&D are being undertaken. In addition, R&D for the subsequent project called the PRISM/PRIME with an experimental sensitivity of better than 10^{-18} has started in the international framework. In this paper, we would like to present physics motivation and report all the experimental status on the COMET.

Primary author: Prof. KUNO, Yoshitaka (Osaka University)

Presenter: Prof. KUNO, Yoshitaka (Osaka University)

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