論文の内容の要旨

Measurement of the branching fraction of tau lepton decay to the final state of pion, lepton, lepton and neutrino at Belle

（Belle 実験でのタウレプトンのパイオン＋レプトン＋レプトン＋ニュートリノへの崩壊の測定）

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Using a 562 fb^{-1} dataset collected at the Y(4S) resonance with Belle detector at the KEKB asymmetric-energy $e^+ e^-$ collider, the branching fractions for rare tau decays $\tau^\pm \to \pi^\pm l^+ l^- \nu_\tau$ are measured, where l is an electron or a muon.

The branching fraction of $\tau^\pm \to \pi^\pm e^+ e^- \nu_\tau$ is measured to be $B(\tau^\pm \to \pi^\pm e^+ e^- \nu_\tau) = (2.33 \pm 0.19 \pm 0.30) \times 10^{-5}$, where the first uncertainty is statistical and the second is systematic. This result is the first measurement on this decay mode. In the case of $\tau^\pm \to \pi^\pm \mu^+ \mu^- \nu_\tau$, an upper limit on branching fraction is obtained, $B(\tau^\pm \to \pi^\pm \mu^+ \mu^- \nu_\tau) < 0.55 \times 10^{-5}$ at 90% confidence level. This result is the first upper limit on this decay mode.

The measured results are consistent with the theoretical prediction from the Standard Model. The result of this measurement would contribute to future studies of physics beyond the Standard Model, such as lepton flavour violation searches.