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Tau physics prospects at Belle II

The Belle II experiment is a substantial upgrade of the Belle detector and will operate at the SuperKEKB energy-asymmetric e^+e^- collider. The design luminosity of the machine is $8 \times 10^{35} \text{ cm}^{-2}\text{s}^{-1}$ and the Belle II experiment aims to record 50 ab^{-1} of data, a factor of 50 more than its predecessor. From February to July 2018, the machine has completed a commissioning run and main operation of SuperKEKB has started in March 2019. Belle II has a broad τ physics program, in particular in searches for lepton flavour and lepton number violations (LFV and LNV), benefiting from the large cross section of the pair wise τ lepton production in e^+e^- collisions. We expect that after 5 years of data taking, Belle II will be able to reduce the upper limits on LF and LN violating τ decays by an order of magnitude. Any experimental observation of LFV or LNV in τ decays constitutes an unambiguous sign of physics beyond the Standard Model, offering the opportunity to probe the underlying New Physics. In this talk we will review the τ lepton physics program of Belle II.

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