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Early physics prospects for radiative and electroweak penguin decays at Belle II

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Summary

In the recent years, several measurements of B-decays with flavor changing neutral currents, i.e. $b \to s$ transitions hint at deviations from the Standard Model (SM) predictions.These decays are forbidden at tree-level in the SM and can only proceed via suppressed loop level diagrams. Rare decays of B mesons are an ideal probe to search for phenomena beyond the SM, since contributions from new particles can affect the decays on the same level as SM particles.

The Belle II experiment is a substantial upgrade of the Belle detector and operates at the SuperKEKB energy-asymmetric e^+e^- collider. Early physics goals of the Belle II physics program are to rediscover these rare decays. Especially radiative $b \to s\gamma$ decays can be rediscovered with only a small dataset and in near future Belle II can provide independent tests of recent anomalies in $b \to s\ell\ell$ decays. Ultimately, the unique setup at Belle II allows to study of modes with missing energies like $B \to K^*\nu\bar{\nu}$.

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