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Measurement of the CKM angle γ with Belle II

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The CKM angle γ is the least well known of the angles of the unitarity triangle and the only one that is accessible with tree-level decays in a theoretically clean way. The Belle II experiment is a substantial upgrade of the Belle detector and will operate at the SuperKEKB energy-asymmetric e^+e^- collider. The accelerator has already successfully completed the first phase of commissioning with the first electron positron collisions in Belle II recorded in 2018. The design luminosity of SuperKEKB is 8×10^{35} cm^{-2}s^{-1} and the Belle II experiment aims to record 50 ab^{-1} of data, a factor of 50 more than the Belle experiment. The key method to measure γ is through the interference between $B^+ \to D^0K^+$ and $B^+ \to \bar{D}^0K^+$ decays which occurs if the final state of the charm-meson decay is accessible to both the D^0 and $\bar{D}^0$ mesons. To achieve the best sensitivity, a large variety of D and B decay modes is required, which is possible at Belle II experiment as almost any final state can be reconstructed including those with photons. With the ultimate Belle II data sample of 50 ab$^-$1, a determination of γ with a precision of 1 degree or better is foreseen. This talk will explain the details of the planned measurement at Belle II and include results related to these measurements obtained with the data already collected.

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