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Measurement of the CKM angle γ at 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 key method to measure γ is through the interference between $B^+ \rightarrow D^0 K^+$ and $B^+ \rightarrow \bar{D}^0 K^+$ decays which occurs if the final state of the charm-meson decay is accessible to both the D^0 and \bar{D}^0 mesons. The Belle II experiment at the SuperKEKB energy-asymmetric e^+e^- collider is a substantial upgrade of the B factory facility at the Japanese KEK laboratory. 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, achieved a peak luminosity of $5.5 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$, and Belle II has recorded a data sample of about 0.5 fb^{-1} . Main operation of SuperKEKB has started in March 2019. 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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