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## Measurements of $B \rightarrow D^{(*)}K$ and $B \rightarrow D^{(*)}\pi$ related to the determination of $\gamma$ at Belle II

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The CKM angle  $\gamma$  ( $\phi_3$ ) of the unitarity triangle is the only one that is accessible with tree-level decays in a theoretically clean way. The key method to measure  $\gamma$  is through the interference between  $B^+ \rightarrow D^0 K^+$  and  $B^+ \rightarrow \bar{D}^0 K^+$  decays that 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. Belle II experiment aims to record  $50 \text{ ab}^{-1}$  of data, a factor of 50 more than its predecessor. With the ultimate Belle II data sample of  $50 \text{ ab}^{-1}$ , a determination of  $\gamma$  with a precision of 1 degree or better is foreseen. Main operation of SuperKEKB started in March 2019 and results from the full available Belle II data set, which corresponds to approximately  $100\text{-fb}^{-1}$ , will be presented. The ratios of decay rates of  $\Gamma(B^- \rightarrow D^{(*)0} K^-) / \Gamma(B^- \rightarrow D^{(*)0} \pi^-)$  and  $\Gamma(\bar{B}^0 \rightarrow D^{(*)+} K^-) / \Gamma(\bar{B}^0 \rightarrow D^{(*)+} \pi^-)$  are measured. In addition, more detailed studies of  $B^- \rightarrow D(K_S^0 \pi^+ \pi^-) K^-$ ,  $B^- \rightarrow D(K_S^0 \pi^0) K^-$  and  $B^- \rightarrow D^{*0}(D^0 \pi^0) K^-$  decays are described; these modes are key to the accurate determination of  $\gamma$  at Belle II.

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### Collaboration / Activity

Belle II

**Presenter:** WACH, Benedikt (BELLE (BELLE II Experiment))

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