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CP Violation sensitivity at the Belle II Experiment

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The measurement of the time-dependent CP violation parameters for B-meson decays is crucial for tightening the constraints on the unitarity triangle and for the search of new physics beyond the Standard Model.

A clean environment for the study of B decay channels is provided by B-factories. With a design luminosity of 8 · 10ˆ35 cmˆ−2sˆ−1, leading ultimately to an integrated luminosity beyond 50 abˆ−1, the new B-factory SuperKEKB will exceed the record instantaneous luminosity of its predecessor KEKB by a factor of 40. The new Belle II detector will exploit the expected high statistics data sample thanks to a major upgrade of the tracking system, including a novel pixel vertex detector in its innermost part. Additionally, the detector capabilities will be complemented by substantial improvements in the reconstruction software.

We develop a strategy for CP violation analysis in order to maximally exploit the new data set and to characterize the sensitivity of Belle II for various benchmark B decay channels.

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