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The Belle II experiment: first results and prospects

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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. With this data set, Belle II will be able to measure the Cabibbo-Kobayashi-Maskawa (CKM) matrix, the matrix elements and their phases, with unprecedented precision and explore flavor physics with B and charmed mesons, and τ leptons. Belle II has also a unique capability to search for BSM rare decays and forbidden modes. From February to July 2018, the machine has completed a commissioning run. Regular operations, with full detector, have started in March 2019 achieved a peak luminosity of $1 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$, and Belle II has recorded a data sample of about 7 fb^{-1} . In this presentation, we will review the status of the Belle II detector, the results from the early data, and the prospects for the study of rare decays, in the quest of uncovering New Physics.

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