



SPEAKER: Oskar Hartbrich  
TITLE: **Belle II - First Collisions in a new particle physics experiment at the intensity frontier**  
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## ABSTRACT

The B factory experiment Belle at the KEKB collider at KEK (Tsukuba, Japan) was built to experimentally investigate CP violation in the B system. Belle and BaBar ultimately confirmed large mixing induced CP violation, leading to the 2008 Nobel Prize in Physics for Kobayashi and Maskawa. The upgrade of the accelerator and experiment to SuperKEKB and Belle II will refine the measurements of previous B factories with vastly improved precision. The upgraded SuperKEKB accelerator will operate at an instantaneous luminosity of up to  $8 \times 10^{35} \text{ cm}^{-2} \text{ s}^{-1}$ , 40 times larger than that of KEKB. The increased luminosity puts high demands on the detector electronics and data acquisition systems. In order to cope with these requirements, the Belle II upgrade fully replaced the tracking and particle identification (PID) systems of the Belle detector, with substantial upgrades to the readout electronics and some of the active material in the outer detector parts. Complementary to LHCb, the Belle II detector offers high reconstruction efficiencies for electrons and muons as well as final states with  $K_{\text{shorts}}$  and neutrals ( $\pi^0$  and  $\eta$ ). The hermetic design enables the reconstruction of multi-neutrino final states and a good resolution on the missing energy. After a commissioning run of electron positron collisions on the  $Y(4s)$  resonance of 10.6 GeV in the spring of 2018, the full silicon vertexing systems are now installed in the experiment, and the first physics run of Belle II is underway since March of this year. This talk will give an overview of the Belle II detector and some of its technological highlights focusing on the silicon tracking and barrel particle identification systems, as well the status and performance of the accelerator and detector during its first physics collisions.