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The Belle II Upgrade Program

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The Belle II experiment at the SuperKEKB e+e- collider has started data taking in 2018 with the perspective of collecting 50ab⁻¹ during the next several years. The detector is working well with very good performance, but the first years of running are showing novel challenges and indicate the need for an accelerator consolidation and upgrade to reach the target luminosity of 6E35 cm⁻²s⁻¹, which might require a long shutdown in the timeframe of 2026-2027. To fully exploit physics opportunities, and to ensure reliable and efficient detector operations, Belle II has started to define a detector upgrade program to make the various sub-detectors more robust and performant even in the presence of high backgrounds, facilitating the SuperKEKB running at high luminosity.

This upgrade program will possibly include the replacement of some readout electronics, the upgrade of some detector elements, and may also involve the substitution of entire detector sub-systems such as the vertex detector. The process has started with the submission of Expressions Of Interest that are being reviewed internally and will proceed towards the preparation of a Conceptual Design Report currently planned for the beginning of 2023. This paper will cover the full range of proposed upgrade ideas and their development plans.

In-person participation

Yes

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