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Belle II Track Reconstruction and Results from first Collisions

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In early 2018, e+e- collisions of the SuperKEKB B-Factory will be recorded by the Belle II detector in Tsukuba (Japan) for the first time. The new accelerator and detector represent a major upgrade from the previous Belle experiment and will achieve a 40-times higher instantaneous luminosity. Special considerations and challenges arise for track reconstruction at Belle II due to multiple factors. This high luminosity configuration of the collider increases the beam-induced background by many factors compared to Belle and a new track reconstruction software has been developed from scratch to achieve an excellent physics performance in this busy environment.

Even though on average only eleven signal tracks are present in one event, all of them need to be reconstructed down to a transversal momentum of 50 MeV and no fake tracks should be present in the event. Many analyses at Belle II rely on the advantage that the initial state in B-factories is well known and a clean event reconstruction is possible if no tracks are left after assigning all tracks to particle hypotheses.

This contribution will introduce the concepts and algorithms of the Belle II tracking software. Special emphasis will be put on the mitigation techniques developed to perform track reconstruction in high-occupancy events. First results from the data taking with the Belle II detector will be presented.

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