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Collimation System Optimization at the SuperKEKB Collider. ANDRII NATOCHII, Univ of Hawaii, BELLE II BEAM BACKGROUND GROUP TEAM — The SuperKEKB asymmetric electron-positron collider, which provides data for the Belle II experiment in Tsukuba, Japan, is operational and has already reached a luminosity of 1e34 cm-2 s-1. The ultimate target luminosity of 8x1e35 cm-2 s-1 is forty times higher than that achieved by the predecessor KEKB. The large improvement requires an upgraded machine lattice and higher beam currents which lead to increased beam backgrounds. Therefore, a dedicated beam collimation system is crucial to protect Belle II. We present a new simulation procedure, based on the Strategic Accelerator Design (SAD) software framework, used to optimize the collimation system. We aim to optimize the transverse widths of existing collimators, and the longitudinal positions of additional collimators to be installed in the future, in order to maximally and safely reduce interaction region (IR) losses while maintaining acceptable beam lifetime. The developed software allows us to perform a deep analysis of the machine properties, including these collimator optimizations, with greatly reduced computational time. The obtained set of collimator widths (known as the machine mask) serves as a guideline for the experimental setup of collimators.

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