

## **SAD-Based Particle Tracking Simulation of Injection Efficiency and Beam Loss in SuperKEKB LER**

This study employs the SAD program to perform particle tracking simulations of the multi-turn injection process in the SuperKEKB Low-Energy Ring (LER). By tracking large numbers of particles, we quantitatively analyze the beam loss distribution and identify the primary sources of particle loss during injection. The results provide a detailed understanding of the factors limiting the injection efficiency and offer insights for optimizing the injection parameters to mitigate beam loss.

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