

eeFACT 2025 - 70th ICFA Advanced Beam Dynamics Workshop on High Luminosity Circular e+e-Colliders



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Experiences with SuperKEKB IR alignment&installation

SUPERKEKB was constructed by reusing the existing KEKB tunnel located 11 m underground. A major upgrade to SuperKEKB was started in 2010, and after five and a half years of construction, SuperKEKB was commissioned in February 2016.

In SuperKEKB, a superconducting magnet system called QCS provides the strong magnetic field needed to focus the beams at the interaction point (IP). Cryostats containing these magnets are mounted on a moving platform in a cantilevered structure. The movable platform is firmly fixed to the beamline floor, but since it is cantilevered, the part near the IP is not.

Capacitive gap sensors similar to those used in KEKB are attached to measure the distance between the Belle II CDC detector and the cryostat during beam operation. In addition, the HLS sensors are placed near the IP and constantly monitor the level change of the floor. There is a strong correlation among the floor motion obtained from the HLS sensors, QCS cryostat movement seen by the gap sensors and the vertical vertex position obtained from the Belle II data. It was also found that these were correlated with the outside air temperature. A building deformation simulation gives a possible and reasonable explanation for this correlation.

The daily, seasonal and other movements of these will be reported. We will also take this opportunity to share our experiences with installation and alignment of the SuperKEKB interaction region.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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