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SEXTUPOLE MAGNETS ON TILTING TABLES IN SUPERKEKB

To increase the peak luminosity of KEKB accelerator, which had been operated as B-factory, by about 40 times and to perform more precise B-factory experiments, KEKB accelerator has improved into SuperKEKB accelerator. In SuperKEKB, large current beams of nano-meter size must orbit and collide precisely to increase the peak luminosity. Especially, chromatic x-y coupling at the interaction point must be corrected to realize significantly low emittance beams. SuperKEKB adopted twenty-four rotating sextupole electromagnets for correcting the chromatic x-y coupling in the positron ring (LER). These sextupole electromagnets, which are mounted on tilting tables, generate arbitrary skew sextupole fields at LER. The tilting table can roll around the longitudinal axis from -30 degrees to + 30 degrees with an accuracy of 0.1 mrad by remote control. When the sextupole electromagnets were installed on tilting tables, magnet positions were aligned so that the magnet physical axis was as close as 0.1mm or less to the rotational central axis. Then these magnets were installed in LER beam line. The tilt angle of the sextupole electromagnet is monitored by a calibrated inclinometer. In the 2021c run, one of the chromatic coupling parameters was adopted using different setups of the tilting angles of the 24 sextupole magnets for the first time in a collider. The study results of the beam optics adjustment test performed by rotating sextupole electromagnet with stored beam are reported.

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