

**Beam Based Sextupole Alignment with Pi-Bump Orbit,** S. KAMDA, Y. KOBOYASHI, H. KOISO, S. MATSUMOTO, N. YAMAMOTO, KEK -

Misaligned sextupole magnets tend to be main sources of large coupling and/or small dynamic aperture of circular particle accelerators. At KEKB whose vertical emittance is expected to be very small, precision of sextupole alignment should be better than 100 microns. Although conventional alignment methods could meet this requirement, direct measurement of alignment errors using a stored beam is desirable. We have developed a new alignment method of sextupole magnets based on a beam orbits in circular accelerators. This method applies a series of pi-bumps at a position of a sextupole magnet and measures leakage orbits outside the pi-bumps. Magnetic centre of sextupole is determined by analysing the dependence of the leakage orbit amplitudes on heights of applied bumps in both horizontal and vertical directions. The method was examined at the TRISTAN main ring experimentally. The sextupoles were measured within a few 10 microns accuracy using the beam position monitors of 30 microns accuracy. Use of a position monitoring system which has better accuracy and quicker turn around time and of a steering magnet system which provides series of pi-bumps quickly will enhance performance of this method.