KEKB asymmetric e⁺/e⁻ ring

The KEKB Asymmetric B-Factory consists of two storage rings, the LER (3.5GeV, 2.6A, e⁺) and the HER (8GeV, 1.1A, e), the injector Linac and the beam-transport system. The full commissioning of the accelerator started on Dec. 1998. The BELLE detector was installed on May 1999.

The luminosity goal is

 10^{34} cm⁻²s⁻¹ while the achieved luminosity is

 $10^{32} \text{ cm}^{-2}\text{s}^{-1}$.





The Injector Linac provides 8GeV, 1.2nC electron beam and 3.5GeV, 0.6nC positron beam to the KEKB rings with the maximum repetition rate of 50 Hz.

Schematic view of KEKB.

A crab crossing scheme with superconducting cavities is a future option. The LER and HER are installed in the existing TRISTAN tunnel (3 km circumference) side by side.



Superconducting cavities for HER at Nikko straight section. Four single-cell 508 MHz damped cavities are used. The maximum beam loading of 380 kW/cavity was achieved.



Normal-conducting cavities, ARES (accelerator resonantly coupled with energy storage), for LER at FUJI straight section (left). ARESs for HER are placed at Oho straight section.



The interaction region with finite crossing angle (+/- 11mrad). The final vertical focusing of the two beams is achieved by a pair of superconducting quadrupole magnets (β y at IP is 1cm). The superconducting solenoid magnets are used to compensate solenoid fields created by the detector.



The HER (left) and the LER (right) at one of the arc sections. A non-interleaved chromaticity correction scheme and 2.5π lattice are adopted to have a large dynamic aperture.

