

# Recent survey results of the SuperKEKB MR and the study of the ATL application

*Thursday 10 October 2024 10:38 (4 minutes)*

SuperKEKB is a double ring collider consisting of a 7 GeV electron ring (HER) and a 4 GeV positron ring (LER) with a circumference of 3 km.

SuperKEKB was constructed by reusing the KEKB tunnel that was shut down in 2010. The KEKB beamline magnets were aligned in the same plane at the time of construction. SuperKEKB utilizes “nano-beam scheme,” where two low emittance beams collide with a large crossing angle at the interaction point (IP) and therefore it is more sensitive to machine errors such as misalignment than KEKB. To achieve higher luminosity than KEKB, it is necessary to compensate for the distortion of the closed orbit and optical function caused by tunnel subsidence.

The rate of the tunnel subsidence varies from year to year. There are some structures in the subsidence variations along the tunnel, possibly due to excavation work done in the vicinity of the tunnel between 2013 and 2014. Tunnel level surveys are performed every summer to confirm that there are no problems to SuperKEKB’s high luminosity operation with the optics group.

An empirical ATL law was applied to describe the complicated structural level variations of the SuperKEKB tunnel, using the level data from 2005 to 2023. The new survey results and the study on the ATL application will be reported.

**Author:** MASUZAWA, Mika (KEK)

**Co-authors:** UEKI, R. (KEK); NAKAMURA, S. (KEK)

**Presenter:** MASUZAWA, Mika (KEK)

**Session Classification:** Poster session and Coffee @ B053