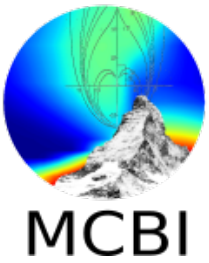

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* A wake fields evaluation for beam collimators and the 60 pC electron beam at the Compact ERL at KEK

Tuesday 24 September 2019 16:40 (10 minutes)

When a high intensity charged beam passes through locations with narrow apertures, such as the rod of a collimator, undesirable wake fields can be generated and adversely affect the beam. The Compact ERL at KEK mainly uses five beam collimators (one at the injector line, one at the merger section, and three in the recirculation loop) to remove the beam halo and to localize the beam losses. Those collimators are composed of four cylindrical rods of 7 mm in radius made of copper. Rods can be inserted independently from the top, bottom, left, and right of the beam chamber. There are no tapers in these rods, and the bunch length of the beam is usually as short as a few ps or less. We investigated the effect of the collimator on the beams. Namely, the emittance increase due to the transverse wake field caused by the shape and the resistivity of the collimator. And the energy loss of the beam due to the longitudinal wake field. The longitudinal and transvers wake fields of the collimator were calculated in CST simulation. Here, we report both the simulated and evaluated longitudinal and transverse wake fields and their effects on the beam.

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