

RF reference phase control system in the SuperKEKB injector LINAC

Tuesday 27 August 2024 16:00 (2 hours)

The RF reference phase in the SuperKEKB injector LINAC has been specially controlled for the stable beam injection to the main rings (HER/LER). The phase control system consists of three parts: MOFB, MOPS and SECT35PS. MOFB is the phase feedback system for drift compensation between the LINAC master oscillator (LMO) of 571.2 MHz and ring MO (RMO) of 508.9 MHz which has frequency ratio of 49/55 to the LMO. MOPS is the MO phase shifter. The LMO phase needs to be shifted smoothly depending on the injection phase for HER or LER rings in the repetition rate of 50 Hz. The laser system of the photocathode RF gun for HER beam, however, does not accept such fast phase changes. The MOPS module, therefore, has been developed to satisfy the requirement of the laser system and injection phase adjustment. SECT35PS is the phase shifter of 2856 MHz RF reference for downstream side of positron damping ring (DR) located in the middle of the LINAC. DR is operated with the same frequency as the main rings, 508.9 MHz. To increase the synchronization probability for the bucket selection of LER ring, the LINAC reference phase at the downstream of DR is changed pulse-to-pulse by the bucket selection system. This paper describes the RF reference phase control system.

Footnotes

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