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OR09 - Optimization tool for RF phase and beam loading distribution among RF stations in SuperKEKB

Tuesday, 12 September 2023 17:00 (30 minutes)

SuperKEKB is an e-/e+ collider which targets the world highest luminosity. It recently achieved a new world record luminocity 4.71 × 10^34 /cm^2/s with beam current 1.4 A. In the future, beam current will be increased further to aim at the design value 3.6A. The RF system consists of 38 cavities (30 klystron stations), which share the huge beam loading brought by the high current beam. It is important to distribute beam loading properly among RF stations. It is equivalent to adjust the acceleration phase of each station. However, it is difficult to evaluate acceleration phase using only the cavity pickup signal. Therefore, we established a method to evaluate and adjust beam loading balance (acceleration phase) through RF feed power measurements. Additionally, we developed a software to evaluate and optimize beam loading balance easily and accurately. This presentation introduces the method and the developed software.

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Session Classification: Controls - The Interface between Operator and Accelerator