

GFA Accelerator Seminar

Compensation of transient RF voltage in a double RF system using a kicker cavity

**Tuesday, 30 October 2018,
09:30h, WSLA/108**

**Attention:
Limited space !!**

Dr. Naoto Yamamoto, KEK, Japan

In quasi diffraction-limited synchrotron light sources, especially in the low-to-medium energy range, emittance growth due to intrabeam scattering (IBS) is a serious concern. To mitigate the IBS, a double RF system is used to lengthen the beam bunches. In the double RF system, the performance of bunch lengthening is limited by the transient beam-loading effect which is induced by bunch gaps in the filling pattern.

Even if superconducting (SC) harmonic cavities (HCs) are used, the performance of bunch lengthening is limited when the bunch gap is large. To improve their performances, we propose the use of a single "kicker" cavity, having a low loaded Quality factor. The "kicker" cavity provides an RF voltage that is comparable to the fluctuating RF voltages in the main and harmonic cavities, and mitigates the phase shift of beam bunches over the bunch train, while keeping its required generator power modest. As a result of our numerical investigation, a significantly improved bunch lengthening performance can be expected. We will present the concept of this technique and show expected bunch-lengthening performances.

Reference: [1] N. Yamamoto, et al., PRAB 21, 012001 (2018).

Contact: Lukas Stingelin, Tel. 5841