Design of The SwissFEL BPM System

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Abstract
SwissFEL is a Free Electron Laser (FEL) facility being constructed at PSI, based on a 5.8GeV normally conducting main linac. A photocathode gun will generate two bunches with 28ns spacing at 100Hz repetition rate, with a nominal charge range of 10-200pC. A fast beam distribution kicker will allow to distribute one bunch to a soft X-ray undulator line and the other bunch to a 0.1mm hard X-ray undulator line. The SwissFEL electron beam position monitor (BPM) system will employ three different types of dual-resonator cavity BPMs, since the accelerator has three different beam pipe apertures. In the injector facility being constructed at PSI, based on a BPM Pickups mable LO & ADC clock frequency & phases.

SwissFEL

RF Front-End

ADC Mezzanine

Modular BPM Unit “MBU”

BPM8 (Undulators)

BPM16 (Linac, Transfer Lines)

BPM Pickups
• Based on SACLA/E-XFEL Design
• Optimized for low charge & costs
• 3 apertures -> 3 types. Only cavities.

BPM38 (Dump, BC2, Kicker-Area)

BPM Test Area at SwissFEL Injector Test Facility (SITF)

RF Front-End

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