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Progress on experimental efforts to investigate CSR shielding effects

Wednesday 4 June 2025 16:00 (2 hours)

A collaboration is underway to investigate the impact of CSR and shielding on the beam of various shapes as it passes through a chicane. Experimental efforts are being made at the Argonne Wakefield Accelerator (AWA) facility. Currently, the facility is equipped with two identical doglegs with reversing quadrupoles that allow doglegs to function as a chicane, and manually adjustable shielding gaps in dipole magnet chambers. A 6.4-ps-long flattop laser pulse is generated using alpha-BBO crystals, and linac phase is adjusted to either preserve the bunch length or slightly compress it through the chicane. While the expected beam behavior was observed during the initial experiment, the current chicane's exceptionally large R56 (=0.45 m) rendered it sensitive to modulations from the alpha-BBO configuration. We have confirmed a new beam-based tuning procedure for BBO crystals at the AWA facility and its effect on modulations. We present the summary of experimental efforts to date and outline future plans.

Footnotes

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