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Transverse deflecting cavity optimization for active control of electron beam energy chirp

Wednesday 13 August 2025 16:00 (2 hours)

The Transverse Deflecting Cavity Based Chirper (TCBC) is a novel concept of imposing and removing a significant energy chirp of an ultra-relativistic electron beam. The TCBC method requires much less footprint, compared to the conventional chirping and dechirping method involving operating a linear accelerator off-crest. When the compressed bunch is very short, the dechirping has to rely on the wakefields. We present our updated design of the L-band traverse deflecting cavity (TDC) for demonstrating the TCBC concept at the Argonne Wakefield Accelerator (AWA) facility. Our TDC design update is based on the original design provided by Tsinghua University. The TDC design update focused on ensuring improved performance under more intense electromagnetic fields, reducing the peak pulsed temperature rise. The tuners of the TDC were meanwhile reworked to allow greater adjustability of the resonant frequency and of the electromagnetic field balance among the cells. We also report the tolerance study of the TDC. Two copies of the TDC with the updated design are currently under fabrication with Dymenso, LLC.

Please consider my poster for contributed oral presentation

Yes

Would you like to submit this poster in student poster session on Sunday (August 10th)

No

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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