Contribution ID: **172** Contribution code: **WEP049** Type: **Poster Presentation**

Investigation of Wakefields in Dielectric Structures with Different Cross Sections

Wednesday 13 August 2025 16:00 (2 hours)

Dielectric-lined waveguides are a promising platform for high-gradient beam-driven dielectric wakefield acceleration (DWFA). We present experimental results from a recent study at the Argonne Wakefield Accelerator (AWA), focusing on the performance of three copper-coated dielectric structures with distinct cross-sections: circular, rectangular, and square. These geometries enable a comparative evaluation of the accelerating gradients and wakefield characteristics supported by each configuration. A key feature of this experiment is the use of a "loading bunch" to suppress the wakefield, demonstrating active control of energy transfer along the beam path. To directly measure wakefield suppression, a circular structure with an angled downstream cut was used to redirect coherent Cherenkov radiation into an autocorrelator for temporal diagnostics. Accelerating gradients were measured using a single-shot longitudinal phase space diagnostic, providing insight into geometry-dependent wakefield behavior. These results support future structure optimization efforts and advance experimental techniques for wakefield control in dielectric-based acceleration.

Please consider my poster for contributed oral presentation

No

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

Yes

Footnotes

Funding Agency

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I have read and accept the Privacy Policy Statement

Yes

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