Contribution ID: **166** Contribution code: **WEP017** Type: **Poster Presentation**

Design and cold test of a novel waveguide power splitter for distributed power coupling in short-pulse acceleration

Wednesday 13 August 2025 16:00 (2 hours)

RF breakdown is the major limitation to achieving higher accelerating gradients. Recent experimental evidence shows that this limitation can be mitigated by reducing the RF pulse length to a few nanoseconds. One key challenge in designing an accelerator operating in the short-pulse regime is achieving the required short filling time. In this work, we designed a novel waveguide power splitter to independently feed an array of accelerating cells. A prototype X-band waveguide array for a one-to-four power splitter has been developed to drive standing-wave cavities operating in the short-pulse regime. The power is designed to be equally split and fed into four cavities, with the desired phase advance per cavity. A 3D-printed prototype has been used for low-power microwave measurements ("cold" tests). The results, including measurements with a vector network analyzer and time-domain measurements, show good agreement with simulations. Ongoing work includes designing a multi-cell accelerator based on this concept for two-beam acceleration with few-nanosecond RF pulses.

Please consider my poster for contributed oral presentation

Yes

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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