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# S-Band traveling wave accelerating structure to control beam longitudinal phase space of high-repetition-rate X-ray Free-Electron Lasers

*Tuesday 3 June 2025 16:00 (2 hours)*

We will describe a design of a novel continuous wave normal-conducting traveling wave accelerating structure to achieve rapid and flexible control of beam compression. This structure will introduce chirp longitudinal energy distribution of the beam. Our development of the 3.9 GHz chirping accelerating structure enables shot-by-shot beam compression control at megahertz repetition rates for SLAC's Linac Coherent Light Source II and its high-energy upgrade. We optimized cavity shape to minimize the necessary RF power to feed the structure. Input and output couplers were also designed and presented.

## Footnotes

## Paper preparation format

Word

## Region represented

America

## Funding Agency

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