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## **Compression of attosecond x-rays with space-charge induced chirp**

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Single-spike SASE radiation exhibits partial temporal coherence, creating an opportunity to compress pulses below the slippage length limit. In this case, the FEL pulse length will be limited by the coherent bandwidth. We consider how arbitrary control of the electron beam chirp can be used to first create a large coherent bandwidth through the chirp-taper dynamics; and secondly to compress that pulse in an afterburner by creating a mismatch between the chirp of the bunching and of the radiation.

### **Footnotes**

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