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## Generation of sawtooth correlation for bunching factor enhancement

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Bunch trains have been considered as a promising means of generating intense, coherent radiation in compact accelerator facilities. However, conventional methods, which impart a sinusoidal modulation on the beam's longitudinal phase space, are inefficient for generating a high bunching factor density modulation. Only a small fraction of a sinusoidal modulation, which has linearity, primarily forms density spikes while other particles under nonlinear correlation have limited contribution to these spikes. One way to improve such bunching efficiency is imparting a saw-tooth correlation, which has piecewise-linearities. This correlation maximizes the peaks of density spikes as more than 90% of particles will contribute to the spikes. While such correlation can be generated by a series of transverse wigglers, a single transverse wiggler with shaped poles to introduce higher harmonics can generate saw-tooth or saw-tooth-like correlations. We present a recent study on this new approach, employing a shaped-pole transverse wiggler.

### Footnotes

### Funding Agency

### Paper preparation format

LaTeX

### Region represented

North America

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