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## Study of the phase jump method for FEL oscillator

*Sunday 1 June 2025 14:00 (2 hours)*

We propose a phase jump method to improve the electron beam conversion efficiency in FEL oscillator. A fast phase shifter is put between two undulator segments to kick the phase of the electron beam at saturation. The theoretical and simulation results are given based on FELiChEM which is built in Hefei. They indicate that a phase jump value of approximately  $\pi$  at saturation can significantly increase the gain and thus improving the FEL power. Taking  $30\mu\text{m}$  wavelength as an example, the output power is increased by about 2.75 times than before.

### Footnotes

### Paper preparation format

LaTeX

### Region represented

Asia

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