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Automatic online optimization at the SXFEL facility

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The commissioning phase of short-wavelength FEL is often lengthy due to the optimization of thousands of control variables. These variables are frequently interdependent and have non-linear correlations with FEL performance, which makes optimization of such a complex system challenging, particularly for soft XFEL. Additionally, FEL inherently suffers from shot-to-shot intensity jitter, which necessitates online optimization in the presence of strong noise. In this study, we report the results of our experiments using an evolutionary strategy algorithm to enhance FEL intensity despite large intensity jitter.

Footnotes

Paper preparation format

Region represented

Asia

Funding Agency

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