Contribution ID: **1700** Contribution code: **MOPB016** Type: **Poster Presentation**

Multi-dimensional phase space reconstruction based on neural network and polarizable transverse deflecting cavity

Monday 2 June 2025 16:00 (2 hours)

High-dimensional phase space reconstruction is an important tool for achieving precise beam simulation and optimization. We adopt a machine learning approach with a polarizable transverse deflecting cavity to reconstruct the multi-dimensional phase space of electron beam. By scanning the strength of the quadrupole magnets and the polarizations of the deflecting cavity, projections of the multi-dimensional phase space in different directions are obtained. A neural network is first trained with a large dataset, and the trained model is then applied to reconstruct the phase space. The result shows that the reconstructed phase space is good agreement with the original one. This report will describe the methods and results in detail.

Footnotes

Paper preparation format

Region represented

Asia

Funding Agency

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Session Classification: Monday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A06 Free Electron Lasers (FELs)