Contribution ID: **131** Contribution code: **MOP076** Type: **Poster Presentation**

Preliminary study of auto-differentiation algorithm in beam dynamics with stochastic process

Monday 11 August 2025 16:00 (2 hours)

Modern particle accelerator optimization requires sophisticated computational methods to address the inherently stochastic nature of beam dynamics. This research develops a framework applying AD to SDEs that specifically addresses beam dynamics challenges in particle accelerators, focusing on accurately modeling and optimizing beam behavior in regimes dominated by stochastic processes. By incorporating key physical phenomena such as synchrotron radiation, wakefield effects, and quantum excitation, the framework aims to provide auto differentiation on the figure of merit of the phase space evolution and beam dynamics. The methodology will enable effective optimization method in a dynamic system with stochastic process.

Please consider my poster for contributed oral presentation

Yes

Would you like to submit this poster in student poster session on Sunday (August 10th)

Yes

Footnotes

Funding Agency

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I have read and accept the Privacy Policy Statement

Yes

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