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High-performance open-source beam dynamics simulation platform: PASS

Thursday, October 23, 2025 5:10 PM (20 minutes)

HIAF is a high-intensity particle accelerator that will perform injection, acceleration, and extraction at a repetition rate of 3 Hz. The beam will be affected by a variety of high-intensity effects. In order to increase the beam intensity, we hope to fully and accurately simulate the impact of those effects so that we can take appropriate suppression measures. For this purpose, we are developing a new simulation platform PASS (Particle Accelerator Simulation Studio). PASS will provide sufficient computing power to support the simulation of multi-effect coupling through large-scale parallel algorithms, and PASS will be an open-source project, hoping to be more widely used and receive feedback. At present, the framework of PASS has been built, providing a very convenient interface for different effects. Through the input file, the free combination of various physical effects can be realized. We have realized the embedding of space charge and beam-beam effect, and the embedding of other effects such as impedance is in progress.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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