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Enhancing plasma wakefield accelerator analysis through machine learning

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In this groundbreaking study, an advanced particle-in-cell (PIC) simulation code, QuickPIC, is used to explore beam physics within Plasma Wakefield Accelerators (PWFA). The primary aim is to comprehensively analyze beam distributions, particularly those exhibiting perturbations with significant instabilities. To connect simulated beam distributions to physical observables, the study uses cutting-edge neural networks. This research underscores the transformative potential of machine learning (ML) in unraveling PWFA complexities and enhancing our capabilities in the development of advanced accelerators.

Footnotes

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