

# Toward start-to-end modeling of plasma-based colliders with the Exascale Particle-In-Cell code WarpX

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The electromagnetic Particle-In-Cell (PIC) code WarpX has been developed within the the U.S. Department of Energy's Exascale Computing Project toward the modeling of plasma accelerators for future high-energy physics colliders on Exascale Supercomputers. The code can be used for start-to-end modeling of plasma-based colliders, from beams' creation to their acceleration in chains of stages to beam-beam interaction at the interaction point (with inclusion of QED effects). The code can also be coupled with other codes and integrated in an ecosystem for fast multi-resolution convergence, cross-benchmarking and design optimization. We will present the latest in the modeling of collider-relevant plasma-based sources, acceleration sections and interaction points with WarpX. Future plans will also be presented and discussed.

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