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HiPACE++: GPU-accelerated modeling of plasma wakefield accelerators

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Modeling plasma wakefield accelerators is computationally challenging. Using the quasi-static approximation allows for efficient modeling of demanding plasma wakefield accelerator scenarios. Here, the latest highlights of the performance-portable, 3D quasi-static particle-in-cell (PIC) code HiPACE++ are presented. HiPACE++ demonstrates orders of magnitude speed-up on modern GPU-equipped supercomputers in comparison to its CPU-only predecessor HiPACE. Thus, HiPACE++ enables fast and accurate modeling of challenging simulation settings, including the proton-beam-driven accelerator AWAKE or low-emittance positron acceleration schemes at unprecedented resolution.

Acknowledgments

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