Abstract Submitted
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Update on the Modeling of Chains of Plasma Accelerator Stages for Future Colliders[1] JEAN-LUC VAY, ANN ALMGREN, DIANA AMORIM, JOHN BELL, Lawrence Berkeley National Laboratory, LIXIN GE, SLAC National Accelerator Laboratory, KEVIN GOTT, Lawrence Berkeley National Laboratory, DAVID GROTE, Lawrence Livermore National Laboratory, MARK HOGAN, SLAC National Accelerator Laboratory, AXEL HUEBL, REVATHI JAMBUNATHAN, REMI LEHE, ANDREW MYERS, Lawrence Berkeley National Laboratory, CHO NG, SLAC National Accelerator Laboratory, MICHAEL ROWAN, OLGA SHAPOVAL, Lawrence Berkeley National Laboratory, MAXENCE THEVENET, DESY, ELOISE YANG, WEIQUN ZHANG, YINJIAN ZHAO, EDOARDO ZONI, Lawrence Berkeley National Laboratory — One of the most challenging application of plasma accelerators is the development of a plasma-based collider for high-energy physics studies. Fast and accurate simulation tools are essential to study the physics toward configurations that enable the production and acceleration of very small beams with low energy spread and emittance preservation over long distances, as required for a collider. The Particle-In-Cell code WarpX is being developed by a team of the U.S. DOE Exascale Computing Project (with non-U.S. collaborators on part of the code) to enable the modeling of chains of tens of plasma accelerators on exascale supercomputers, for collider designs. We will present our latest application of the code to the modeling of up to 10 consecutive multi-GeV stages on the GPU-accelerated Summit supercomputer, together with the latest developments that made it possible.

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