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Absorption of Charged Particles in Perfectly-Matched-Layers<sup>1</sup> REMI LEHE, AURORE BLELLY, JEAN-LUC VAY, Lawrence Berkeley National Laboratory — Perfectly-Matched Layers (PML) are widely used in Particle-In-Cell simulations of plasmas, in order to absorb electromagnetic waves that propagate out of the simulation domain. However, when charged particles cross the boundary between the simulation domain and the PMLs, a number of numerical artifacts can arise (including field reflections, and accumulation of residual static field at the boundary). We introduce a new PML algorithm that significantly mitigates these artifacts. The benefits of this algorithm is illustrated in simulations of laser-plasma acceleration, whereby a significant fraction of the plasma particles exit the simulation domain.

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