

Abstract Submitted
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Thermal emittance from ionization-induced trapping in plasma accelerators¹ CARL SCHROEDER, JEAN-LUC VAY, ERIC ESAREY, CARLO BENEDETTI, CAMERON GEDDES, WIM LEEMANS, Lawrence Berkeley National Laboratory, STEPAN BULANOV, University of California, Berkeley, LULE YU, MIN CHEN, Shanghai Jiao Tong University — The minimum obtainable transverse emittance (thermal emittance) of electron beams generated and trapped in plasma-based accelerators using ionization injection is examined. The initial electron beam transverse phase space distribution following ionization and transit through the laser is derived. Expressions for the normalized transverse beam emittance, both along and orthogonal to the laser polarization, are presented. Results are compared to particle-in-cell simulations. Ultra-low emittance electron beams can be generated using laser ionization injection into plasma accelerators.

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