

Abstract Submitted
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Plasma-based accelerator with magnetic compression¹ PAUL SCHMIT, NATHANIEL J. FISCH, Princeton University — A novel method is proposed to overcome dephasing and pump depletion in plasma-based accelerators, in which the modulation of a modest (few T) axial, uniform magnetic field in the acceleration channel leads to densification of the plasma through magnetic compression. This enables direct, time-resolved control of the plasma wave properties, including amplitude and phase velocity. The methodology is broadly applicable and can be optimized to improve the leading acceleration approaches, such as plasma beat-wave, plasma wakefield, and laser wakefield acceleration for relativistic electrons, as well as wave acceleration of nonrelativistic ions. In the case of wave-particle dephasing, many technical advantages exist compared to other proposed schemes to overcome dephasing.

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