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Simulation Studies of the Pulse Line Ion Accelerator

by

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The Heavy Ion Fusion Science Virtual National Laboratory has been studying the Pulse Line Ion Accelerator (PLIA) concept, motivated by the desire for an inexpensive way to accelerate intense short pulse heavy ion beams to regimes of interest for studies of high energy density matter and fusion ignition conditions. The PLIA uses a slow-wave structure based on a helical winding, on which a voltage pulse is launched and propagated to generate the accelerating fields. The PLIA has the ability to accelerate ion bunches to energies much greater than the peak applied voltage and over distances much larger than the voltage pulse ramp length; furthermore, the PLIA can axially confine the heavy ion beam bunch. These properties make it a good candidate for a high intensity, short bunch injector. We will present self-consistent numerical simulation studies of the beam dynamics in the PLIA.

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