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## Recent Work

### **Title**

Studies of the Pulse Line Ion Accelerator

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PAC07 Invited Talk

ID: 1154 **Studies of the Pulse Line Ion Accelerator**

**Speaker: William L. Waldron** (LBNL, Berkeley, California)

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**Abstract:**

The Pulse Line Ion Accelerator concept was motivated by the need for an inexpensive way to accelerate intense short pulse heavy ion beams to regimes of interest for studies of High Energy Density Physics and Warm Dense Matter. A pulse power driver applied to one end of a helical pulse line creates a traveling wave that accelerates and axially confines the heavy ion beam pulse. The concept has been demonstrated with ion beams at modest acceleration gradients. Acceleration scenarios with constant parameter helical lines are described which result in output energies of a single stage much larger than the several hundred kilovolt peak voltages on the line, with a goal of 3-5 MeV/m acceleration gradients. This method has the potential to reduce the length of an equivalent induction accelerator by a factor of 6-10 while simplifying the pulsed power systems. The performance of prototype hardware has been limited by high voltage flashover across the vacuum insulator. Bench tests and analysis have led to significantly improved flashover thresholds. Further studies using a variety of experimental configurations are planned.