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High Brightness Accelerator for Warm Dense Matter Studies

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High Brightness Accelerator for Warm Dense Matter Studies.¹ ENRIQUE HENESTROZA, SIMON S. YU, Lawrence Berkeley National Laboratory, DAVID P. GROTE, Lawrence Livermore National Laboratory, RICHARD J. BRIGGS, SAIC — A high brightness heavy ion accelerator for creating powerful beams to study warm dense matter is being designed at LBNL. The components are an injector that delivers $0.1 \mu\text{C}$ of sodium beam, and an accelerator that boosts the energy to about 20 MeV. Further beam manipulations will compress the beam to a final spot radius of 1 mm and a pulse length of 1 ns. In order to reach those final parameters, it is required to extract a high brightness beam and minimize the transverse and longitudinal emittance growth along the accelerator. The injector is based on the Accel-Decel concept which enables the extraction of a high line charge density beam from the ion source, and the accelerator is based on the Pulse Line Ion Accelerator concept, which uses a slow-wave structure based on a helical winding, on which a voltage pulse is launched and propagated to generate the accelerating fields. We will present numerical simulations of the beam dynamics in this system.

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Prefer Oral Session
 Prefer Poster Session

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