

Abstract Submitted  
for the DPP10 Meeting of  
The American Physical Society

**A high current, low emittance  $\text{Li}^+$  alumino-silicate ion source and injector**<sup>1</sup> PRABIR K. ROY, JOE W. KWAN, PETER A. SEIDL, WAYNE GREENWAY, LBNL, DAVE P. GROTE, LLNL, JERRY KEHL, MATTHAEUS LEITNER, LBNL, WILLIAM SHARP, LLNL, JEFF TAKAKUWA, JEAN-LUC VAY, WILLIAM WALDRON, JAMES K. WU, LBNL, HIFS-VNL COLLABORATION — We will present the design of a  $\text{Li}^+$  ion source and injector for the Neutralized Drift Compression Experiment-II (NDCX-II) for warm dense matter experiments. The injector has been designed to use a large diameter ( $\approx 11$  cm)  $\text{Li}^+$ -doped alumino-silicate source with an injected ion kinetic energy of 100 keV, pulse duration of  $0.5\mu\text{s}$ , and beam current of 100mA. Using small prototype emitters, at a temperature of approximately  $1275^\circ\text{C}$ , the space charge limited  $\text{Li}^+$  beam current density of  $J \approx 1$  mA/cm<sup>2</sup> was obtained for a 0.64 cm diameter emitting area. The lifetime of the ion source is  $\geq 50$  hours while pulsing the extraction voltage at 2 to 3 times per minute (a rate expected in NDCX-II). We are designing and fabricating a larger diameter source, in parallel with continuing R & D effort to increase the life time of the ion source.

<sup>1</sup>This work was performed under the auspices of the U.S Department of Energy by LLNL under contract DE AC52 07NA27344, and by LBNL under contract . DE-AC02-05CH11231.

Prabir K. Roy  
Lawrence Berkeley National Laboratory (LBNL)

Date submitted: 20 Jul 2010

Electronic form version 1.4