

Abstract Submitted  
for the DPP06 Meeting of  
The American Physical Society

**Development of a low inductance metal vapor vacuum arc (LIZ-MEVVA) ion source**<sup>1</sup> EUSEBIO GARATE, ROGER MCWILLIAMS, JACOB SPRUNCK, ALAN VAN DRIE, University of California, Irvine, ADY HERSHCOVITCH, BNL, Upton, Long Island, NY, BRANT JOHNSON, APS, Ridge, NY and BNL, Upton, Long Island, NY — We are continuing development of a Low Impedance Z-Discharge Metal Vapor Vacuum Arc (LIZ-MEVVA) to produce high charge state metallic ions. The plasma arc occurs in a diode connected to a  $1.4\mu\text{F}$  capacitor by a low impedance transmission line. The capacitor is charged to between 6 and 12kV and stores up to 100J of energy. Currently the electrode material is aluminum and the system has been run in two regimes: an LC dominated “ringing” arc of period  $4.1\mu\text{s}$  and a  $1\text{-}3\mu\text{s}$  wide “pulsed” arc, where a small series resistance has been added to critically damp ringing. The current in the plasma arc can be up to 30 kA. A  $1\mu\text{s}$  pulsed extraction voltage of up to 10kV, which has a variable delay with respect to the start of the arc current, is used to accelerate the ions. Ions are analyzed using time-of-flight and, more recently, a Thomson parabola. To date we have detected  $\text{Al}^+$ ,  $\text{Al}^{++}$  and  $\text{Al}^{+++}$ .

<sup>1</sup>Work supported by research contract with BNL under the DOE IPP2 program

Eusebio Garate  
University of California, Irvine

Date submitted: 21 Jul 2006

Electronic form version 1.4