Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Production, Acceleration, and Propagation of a Symmetric Neutralized Ion Beam NATHANIEL HICKS, ALFRED WONG, University of California, Los Angeles — The first experimental results demonstrating the production of a symmetric neutralized ion beam (SNIB) will be presented. SNIBs are composed of equal quantities of positive and negative ions of the same mass, in this case H^+ and H^-. The production of the SNIB is accomplished by merging together positive and negative ion beams from separate ion sources. An electrostatic transport system guides the beams to the merging point. A novel "SNIB collector" will be described that is used to diagnose the individual components of the beam. Once formed, the SNIB is injected into a radio frequency quadrupole (RFQ) accelerator operating at 200 MHz, with acceleration from 1 keV to 20 keV. This aims to verify the theoretical ability of an RFQ to simultaneously bunch and accelerate positive and negative particles, and also demonstrates the suitability of RFQs for energetic SNIB applications. SNIBs have the theoretical ability to propagate across a transverse magnetic field (the investigation of which is the ultimate scientific goal of this research program), and applications may therefore include injection into magnetic confinement devices for heating and fueling. This work is supported by DOE Contract DE-FG02-04ER54760.

Nathaniel Hicks
University of California, Los Angeles

Date submitted: 22 Jul 2005 Electronic form version 1.4