Abstract Submitted
for the SES07 Meeting of
The American Physical Society

Acoustic Desorption from a Room Temperature Ionic Liquid. PETER HARRIS, EUGENE TRACY, WILLIAM COOKE, College of William and Mary — We report on the acoustic desorption of ions from the surface of a room temperature ionic liquid (RTIL) under vacuum. Our RTIL, 1-butyl-3-methylimidazolium hexafluorophosphate, remains a stable liquid at extremely low pressures ($<10^{-9}$ torr). Using the 2^{nd} harmonic of a Nd:YAG laser, 2ns pulse time, we ablate the backside of a metal foil, generating an acoustic pulse that propagates through the foil, desorbing ions off the surface of the RTIL. We determine the m/q of desorbed ions via time of flight (TOF) measurements from an imaging micro-channel plate detector. We detect both positive and negative ion species, depending on the extraction and acceleration voltages. Our TOF spectra demonstrate our acoustic pulses are of short duration (<20ns), generating mass spectra with good temporal resolution (<40ns FWHM @ t=9000ns), that are stable and reproducible. We discuss the variation of desorbed ion yield as a function of acoustic pulse strength, metal foil properties and extraction fields.

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Date submitted: 17 Aug 2007 Electronic form version 1.4