Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Resonance enhanced multiphoton ionization of benzene-like molecules in focused femtosecond radiation with three-dimensional spatial resolution TIMOTHY SCARBOROUGH, DAVID FOOTE, JAMES STROHABER, CORNELIS UITERWAAL, University of Nebraska-Lincoln — We present experimental results of spatially resolved ion densities of benzene and other benzene-like molecules through the use of a "photodynamical test tube' which circumvents volumetric weighting of the focus (the volume effect) [1]. Within the volume of the test tube, the laser intensity is essentially constant, resulting in measurements very near to the true ionization probability of the target molecule. Using laser radiation with a central wavelength of 800 nm and pulse duration of 50 fs focused to intensities ranging from 10^{13} to 10^{15} W/cm^2, we report experimental verification of REMPI processes in benzene, fluorobenzene, chlorobenzene, bromobenzene, and iodobenzene. In addition, we present preliminary results of the ionization and fragmentation of six-ring aromatic hydrocarbons toluene (C_6H_5-CH_3), aniline (C_6H_5-NH_2), nitrobenzene (C_6H_5-NO_2), and phenol (C_6H_5-OH). Finally, we present similar preliminary results for five-ring aromatic heterocyclic compounds pyrrole (C_4H_4NH), furan (C_4H_4O), and thiophene (C_4H_4S). [1] J. Strohaber and C. J. G. J. Uiterwaal, Phys. Rev. Lett. **100** 023002 (2008).

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Date submitted: 26 Jan 2009 Electronic form version 1.4