Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Excitation of waves by a spiraling ion beam in a large magnetoplasma[1] SHREEKRISHNA TRIPATHI, BART VAN COMPERNOLLE, WALTER GEKELMAN, PATRICK PRIBYL, Department of Physics and Astronomy, UCLA, WILLIAM HEIDBRINK, Department of Physics and Astronomy, UCI, TROY CARTER, Department of Physics and Astronomy, UCLA — A helium ion source (25 kV, 5 A, 0.3 Hz rep rate, 0.5-1.5 ms pulse-width) has been constructed for performing the fusion-relevant fast-ion studies on the Large Plasma Device (LAPD). The ion source comprises a hot-cathode LaB_6 plasma source, a multi-aperture three-grid beam extractor, power supplies, and neutral pumping system. The beam is injected from the end of the device with variable injection angles and it spirals down the LAPD plasma (n$\sim 10^{11}$ cm^{-3}, T_e $\sim$0.4 eV, B = 0.5 – 1.8 kG) radiating a multitude of waves in the drift, shear Alfven, ion cyclotron, and lower hybrid frequency ranges. The beam profiles are measured at several axial locations (up to 12 m from the deaccel grid) using a fast-ion collector. Measurements have confirmed the production of a low-divergence ion beam that forms helical orbits during oblique injection. Initial results on the beam-driven low-frequency waves ($f < f_{lh}$), with a particular emphasis on Alfven waves, will be presented.

[1]Work supported by US DOE and NSF for the fusion campaign at the Basic Plasma Science Facility, UCLA.

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Date submitted: 18 Jul 2012 Electronic form version 1.4