

Abstract Submitted  
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**Injection of super-Alfvénic ion beams in a magnetized plasma of the Large Plasma Device**<sup>1</sup> SHREEKRISHNA TRIPATHI, WALTER GEKELMAN, PATRICK PRIBYL, Department of Physics and Astronomy, UCLA — An ion beam source (25 kV, 1.0 A) has been built for performing fusion-relevant studies on fast-ion interaction with a magnetized plasma in the Large Plasma Device (LAPD). The ion beam source comprises a plasma source, accel/deaccel grids, magnetic focusing coils, and neutral pumping system. The plasma is produced by a 0.4–0.6 MHz, 25 kW inductive RF source. A multi-aperture grid system extracts the ion beam (rep rate: 0.3–1.0 Hz, pulse-width: 0.5–1.5 ms). The beam profiles were measured at several axial locations (up to 12 m from the deaccel grid) using a fast-ion collector. These measurements confirm the production of a low-divergence ion beam that forms helical orbits during oblique injection ( $\theta < 6^\circ$ ). The source fulfills several requirements (e.g., minimal charge-exchange loss of fast-ions) that are specific to its operation on the LAPD. Apart from discussing the development of the fast ion-source, we present initial results on the wave-field spectra excited by hydrogen and helium ion beams in sub-Alfvénic and super-Alfvénic propagation regimes.

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