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Langmuir Probe Analysis of Maser-Driven Alfven Waves Using New LaB6 Cathode in LaPD[1] MARY CLARK, SETH DORFMAN, ZIYAN ZHU, GIOVANNI ROSSI, TROY CARTER, UCLA Basic Plasma Science Facility — Previous research in the Large Plasma Device shows that specific conditions on the magnetic field and cathode discharge voltage allow an Alfven wave to develop in the cathode-anode region. When the speed of bulk electrons (dependent on discharge voltage) entering the region exceeds the Alfven speed, the electrons can excite a wave. This phenomenon mimics one proposed to exist in the Earth's ionosphere. Previous experiments used a cathode coated with Barium Oxide, and this project uses a new cathode coated with Lanthanum Hexaboride (LaB6). The experiment seeks to characterize the behavior of plasmas generated with the LaB6 source, as well as understand properties of the driven wave when using the new cathode. Langmuir probes are used to find electron temperature, ion saturation current, and plasma density. These parameters determine characteristics of the wave. Preliminary analysis implies that density increases with LaB6 discharge voltage until 170 V, where it levels off. A linear increase in density is expected; the plateau implies cathode power does not ionize the plasma after 170 V. It is possible the power is carried out by the generated Alfven wave, or heats the plasma or cathode. This "missing" power is currently under investigation.

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