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A data driven Model of the Existing and Optimal Cs Delivery into the LANSCE H^- Ion Source

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The LANSCE H^- Ion Source delivers a 120 Hz, 15 mA, 10% duty factor beam, which is created via a filament driven hydrogen plasma and cesiated surface-conversion. To induce cesiated surface conversion, the converter is coated in cesium via a basic Cs transfer tube port that is connected to a heated Cs reservoir, such that the amount of Cs flux induced on the converter is increased by increasing the Cs reservoir temperature. A COMSOL model of the Cs flux out of the existing transfer tube and into the LANSCE H^- Ion Source will be utilized using data driven empirical variables: temperature measurements of the source walls and points along the Cs transfer tube, heating power of the filaments, background H2 pressure inside the source, and the Cs density out of the Cs transfer tube using Tunable Diode Laser Spectroscopy. Using these same parameters a study will be done using COMSOL to propose an optimal Cs transfer tube for the LANSCE H^- Ion Source.

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