Abstract Submitted
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Neutral Resonant Ionization by Excited States in Optically Thick Plasmas JOHN VOGEL, University of California (retired) — Ionization from surfaces of low work function explains many properties of both sputter sources of heavy anions and H^- from RF plasma sources for heating magnetically confined plasmas. Surface ionization fails to fully account for intensities and operational peculiarities of either type of ion source, however. A blue plasma above cesium-sputtered material is well associated with intense stable anion beams used in accelerator mass spectrometry (AMS). A theory of neutral resonant ionization within this excited Cs plasma was developed [1] to explain a lack of isotopic fractionation seen in low energy AMS [2]. A similar theory of resonant ionization in hydrogen plasma is possible in which H(2s) atoms, sustained by the optical density of hydrogen for Lyman α radiation, have a path to gas phase production of $H^-(1s^2)$ at high rates. The theory depends at present on data from multiple decades of unrelated experiments. Implications of the theory are used to suggest supportive or discrediting experiments.

[1] J.S. Vogel AIP Conf. Proc. 1515: 89 (2013).
[2] J.S. Vogel, et al. NIM B294: 340 (2013).

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