

Abstract Submitted
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Interpretation of EUV observations in pulsed H₂ and He discharges A.V. PHELPS, JILA, University of Colorado and NIST — We argue that the measurements of EUV spectra from 10 kV, 2.6 J pulsed discharges in H₂ and/or He by Mills and Yu¹ and by Bykanov² are misinterpreted by the authors. The experimental spectra show that, contrary to their model, the background (interpreted by them as continuum emission) varies considerably in shape for Ta, W, and Mo cathodes. The presence of O V and O VI lines and spectra of other than that of He show that significant material is driven from the electrodes and highly ionized by the discharge. Their measurements with Al filters with Ta and W cathodes, show that the largely unidentified spectra are not second order spectra. The claim of an optically thick plasma with Mo electrodes is inconsistent with unsuppressed lines of ionized oxygen, the absence of line reversal, and estimated metal densities and absorption coefficients. The increase in line emission with the H₂ to He ratio and the weak excitation when He is the fill gas suggest the importance of excitation by fast hydrogen neutrals and/or ions. For discharges in He, charge exchange collisions keep He⁺ ion energies and excitation low.

¹R. L. Mills and Y. Lu, *Int. J. Hydrogen Energy* **35**, 8446 (2010).

²A. Bykanov, www.blacklightpower.com/pdf/GEN3_Harvard.pdf.

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