

Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Production of Excited Atomic Hydrogen and Deuterium from H_2 and D_2 Photodissociation T.J. GAY, University of Nebraska-Lincoln, J.D. BOZEK, LBNL, J.E. FURST, University of Newcastle-Ourimbah, H. GOULD, A.L.D. KILCOYNE, LBNL, J.R. MACHACEK, University of Nebraska-Lincoln, F. MARTIN, Universidad Autonoma de Madrid, K.W. MCLAUGHLIN, Loras College, J.L. SANZ-VICARIO, Universidad de Antioquia — We have measured the production of both $Ly\alpha$ and $H\alpha$ fluorescence from atomic H and D for the photodissociation of H_2 and D_2 by linearly-polarized photons with energies between 24 and 60 eV. In this energy range, excited photofragments result primarily from the production of doubly-excited molecular species which promptly autoionize or dissociate into two neutrals. Our data are compared with *ab initio* calculations of the dissociation process, in which both doubly-excited state production and prompt ionization through non-resonant channels are considered. Agreement between our experimental data and that of earlier work [1], and with our theoretical calculations, is qualitative at best. [1] E.Melero García, J.Álvarez Ruiz, S.Menmuir, E.Rachlew, P.Erman, A.Kivimäki, M.Glass-Maujean, R.Richter, and M.Coreno, J.Phys.B **39**, 205 (2006). Support provided by the NSF (Grant PHY-0354946), DOE (LBNL/ALS) and ANSTO (Access to Major Research Facilities Programme).

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Date submitted: 02 Feb 2007

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