

Abstract Submitted  
for the DAMOP01 Meeting of  
The American Physical Society

Sorting Category: 4 (Theoretical)

**Radiative Decay of Helium Doubly Excited States<sup>1</sup>**

CHIEN-NAN LIU, Kansas State University, MING-KEH CHEN, National Chung-Hsin University, Taiwan, C.D. LIN, Kansas State University — A theoretical study of the radiative decay of low-lying doubly excited  $^1P^o$  states of Helium in the energy region below the  $\text{He}^+(N=^oD2)$  threshold is presented. We calculated the oscillator strength from the ground state, the Auger and radiative decay rates, and the natural widths of these states. These rates are used to obtain the photon emission and metastable atom yield spectra to compare with experimental measurements, including those from Odling-Smee *et al.*<sup>2</sup> and Rubensson *et al.*<sup>3</sup>. We showed that the lifetimes of the long-lived doubly excited states are determined by the radiative rates.

<sup>1</sup>The work of CNL and CDL were partially supported by U. S. Department of Energy.

<sup>2</sup>M. K. Odling-Smee, E. Skoell, P. Hammond, and M. A. MacDonald, Phys. Rev. Lett. **84**, 2598 (2000).

<sup>3</sup>J.-E. Rubensson, C. S athe, S. Cramm, B. Kessler, S. Stranges, R. Richter, M. Alagia, and M. Coreno, Phys. Rev. Lett. **83**, 947 (1999).

Prefer Oral Session  
 Prefer Poster Session

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Date submitted: February 5, 2001

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