

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Updated square-well potential model for $A@C_{60}$ photoionization¹

DAVID KEATING², VALERIY DOLMATOV, University of North Alabama — The empirical square-well potential model for photoionization of atoms A associated with endo-fullerenes $A@C_{60}$ [1] has played an important role in providing the initial understanding of their spectra. The model approximates the C_{60} cage by a square-well potential of a certain inner radius r_o , width Δ , and depth U_o . Their values were determined by approximately matching the thus theoretically calculated and experimentally measured photoionization cross section of *empty* C_{60} [2]. The recent, first of its kind, experiment [3] on $A@C_{60}$ (namely, $Xe@C_{60}^+$) photoionization has revealed *quantitative* discrepancies between predictions of the model and experimental data. To us, this implies that r_o , Δ , and U_o for *empty* C_{60} might not be the same as for an *endo-fullerene* $A@C_{60}$. We thus find, and report on, updated r_o , Δ , and U_o which bring on a better quantitative agreement between the model and experiment.

[1] V. K. Dolmatov, Adv. Quant. Chem. **58**, 13 (2009).

[2] Y. B. Xu *et. al.*, PRL **76**, 3538 (1996).

[3] A. L. D. Kilcoyne *et. al.*, PRL **105**, 213001 (2010).

¹This work was supported by the RUI NSF grant No. PHY-0969386.

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Date submitted: 03 Feb 2011

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