Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Suppression of confinement oscillations in photoionization cross sections of endohedral A.S. BALTENKOV, Arifov Institute of Electronics, U. BECKER, Fritz-Haber-Institute, S.T. MANSON, Georgia State University, A.Z. MSEZANE, Clark Atlanta University — Using a model representing the C_{60} cage as a spherical shell formed by smeared carbon atoms, the shape effect of potential U(r) on the photoionization of atom A in A@C_{60} is studied. For potential shell thickness, d less than 1.3-1.5 a.u., confinement oscillations in photoionization cross section of A in A@C_{60} weakly depend on shape of U(r). With increasing d confinement resonances disappear. Additionally, we demonstrate that displacing A from the center of C_{60} cavity also diminishes the amplitude of confinement resonances and results in their disappearance with increasing displacement. The nature of the suppression of confinement oscillation amplitudes is different in the two cases. In the first case, it is due to weakening of the connection of photoelectron wave function oscillations inside and outside the fullerene shell as the thickness of the spherical resonator wall increases. For the off-center position of the atom, it is due to mixing and mutual cancellation of confinement oscillations corresponding to different photoelectron trajectories inside the fullerene cavity. This could explain the absence of confinement effects in 4d photoionization measurement of the off-center Ce atom in Ce@C_{82}^{+} [1].

[1] A. Müller et al, Phys. Rev. Lett. 101, 133001 (2008)

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Date submitted: 20 Jan 2010 Electronic form version 1.4