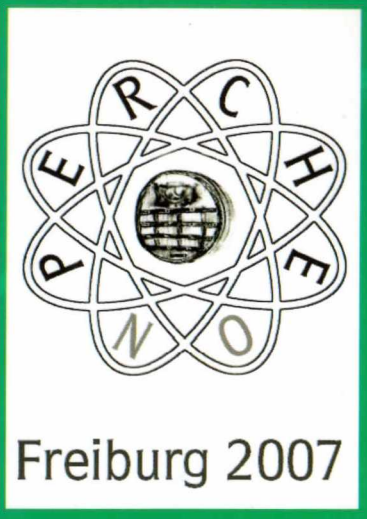

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EXPERIMENTAL AND THEORETICAL STUDY OF DIFFERENTIAL CROSS SECTIONS FOR ELASTIC ELECTRON SCATTERING BY In ATOM IN THE 10-100 eV ENERGY RANGE

B. P. Marinković[1], V. Pejčev[1], D. Šević[1], M. Rabasović[1], D. M. Filipović[1,2], V. I. Kelemen[3], M. M. Dovhanych[3] and E. Yu. Remeta[3]

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Differential cross sections (DCS) for elastic ectron scattering by indium atom have been termined experimentally and theoretically in the termediate impact electron energy range from 10-0 eV. The experiment utilized cross beam chnique[1] where effusive atom beam of In atoms d been perpendicularly crossed by nochromatic electron beam and elastically attered electrons were detected from 10° to 150°. gular distributions were multiplied by effective gth correction factors in order to obtain relative CS. Angular resolution of the spectrometer has en estimated to be 1.5°. Overall energy olution of the spectrometer was 120 meV.

The theoretical results were obtained in terms a model of phenomenological complex optical tential with allowance for spin-orbit interaction *EPASo*-approximation). The calculation without absorption (*SEPSo*-approximation) were carried using a parameter-free real potential. Total and ne subshells electron densities in In atom and tic potential was calculated within the mework of the local relativistic approximation the density functional theory[2] and for them lytical expressions have been obtained. We d the local exchange potential in the free ctron gas approximation[2], the parameter-free relation-polarization potential[3], the spin-orbit ential[4] and the generalization of the McCarthy-e absorption potential $V_a = -Wr^2[\rho_1 + \beta\rho_2]/T^2$. T he local kinetic energy, ρ_1 is sum of electron sities in 5p- and $5s^2$-subshells, and ρ_2 – $4d^{10}$-shell electron density. The values of W and β e determined from the condition of the best eement of theoretical integral inelastic cross ions and elastic DCSs with experimental ones, pectively. For example, for $E \leq 40$ eV $\beta=0$, at 80 $\beta=0.7$ and for $E \geq 200$ eV $\beta=1$.

In Fig.1 relative experimental results are normalized at scattering angle of 20° to DCSs in *SEPASo*-approximation and presented, together with two different approaches.

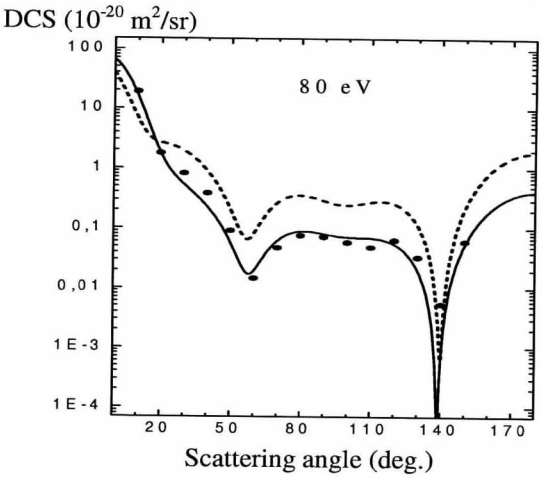

Figure 1. DCSs for elastic electron scattering by In atom at 80 eV impact energy. Experiment: •. Theory: – – –, *SEPSo*; ——, *SEPASo*.

For energy 10, 20, 40, 60 and 100 eV experimental and theoretical DCSs will be submitted at conference.

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