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DIFFERENTIAL CROSS SECTIONS FOR THE ELECTRON EXCITATION OF  
SODIUM ATOM AT 54.4 eV IMPACT ENERGY

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Absolute DCS for the elastic and the  $3^2P$ ,  $4^2S$ ,  $3^2D$  and  $4^2P$  excited states of sodium atom have been obtained for 54.4 eV electron impact energy and from  $0^\circ$  to  $150^\circ$  scattering angles. Although sodium have been widely investigated still, the discrepancies exist between different experimental as well as theoretical data.

The experiment have been performed in crossed beam arrangement. The apparatus described in more details elsewhere (D.Filipović, V.Pejčev, B.Marinković and L.Vušковиć, *Fizika Supplement*, 1988 to appear) consists of hemispherical electron monochromator and an independently rotatable energy analyzer. An atomic beam has been produced by a resistively heated oven. The standard working temperature of the oven was about 600 K corresponding to 5 Pa vapour pressure. The corrections for the effective path length were done due to the interaction volume variation with the scattering angle.

The relative DCS of each state have been measured separately. To obtain absolute scale DCS for the  $3^2P$  state were converted into generalized oscillator strengths and fitted to optical oscillator strength. The absolute scale for the other features was obtained from the measurements of intensity ratios on the energy-loss spectra at particular angle. The comparison of our results with the other available data indicates satisfactory agreement with the previous experiments by S.K.Srivastava and L.Vušковиć (*J.Phys.B* 13 (1980) 2633) for the  $3^2P$  and the  $4^2S$  states and with P.J.O. Teubner, S.J.Buckman and C.J.Noble, (*J.Phys.B* 11 (1978) 2345) for the elastic scattering. The large angle scattering with the excitation of the  $3^2P$  state does not exhibit large values as predicted by recent CC4 calculations by J.Mitroy, I.E.McCarthy and A.T.Stelbovics, (*J.Phys.B* 20 (1987) 4827).

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