# Sixteenth International Conference on the Physics of Electronic and Atomic Collisions

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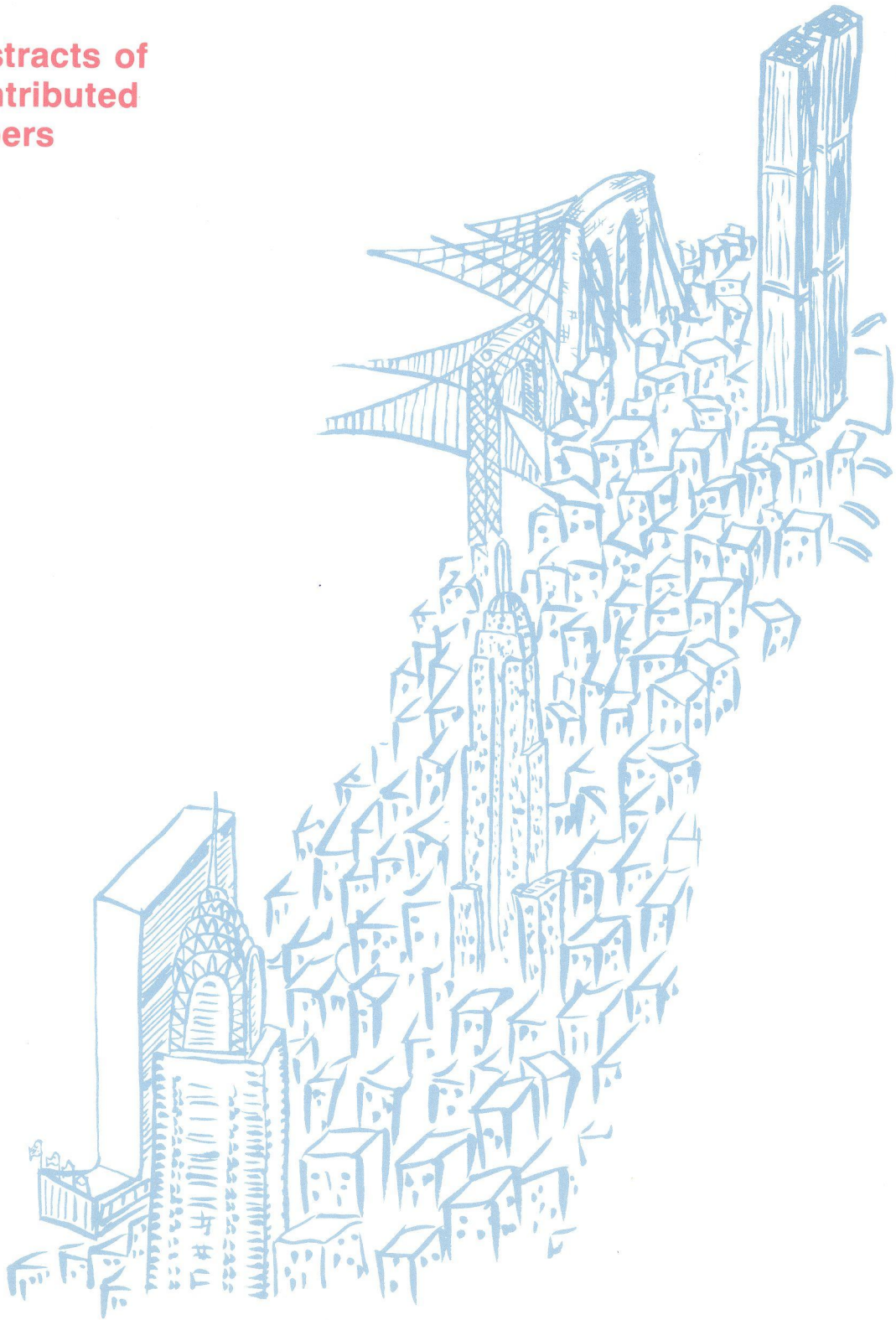
## Abstracts of Contributed Papers

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# ABSOLUTE CROSS SECTIONS FOR THE 54.4 eV ELECTRON SCATTERING BY SODIUM ATOM

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Differential cross sections (DCS) for the elastic and inelastic electron scattering have been obtained for 54.4 eV impact energies and from -30° to +150° scattering angles. The resolved and studied excited states were $3^2P$, $4^2S$, $3^2D$ and $4^2P$.

The crossed electron beam - atom beam technique was employed and the electron spectrometer used in these measurements was described in detail elsewhere[1,2].

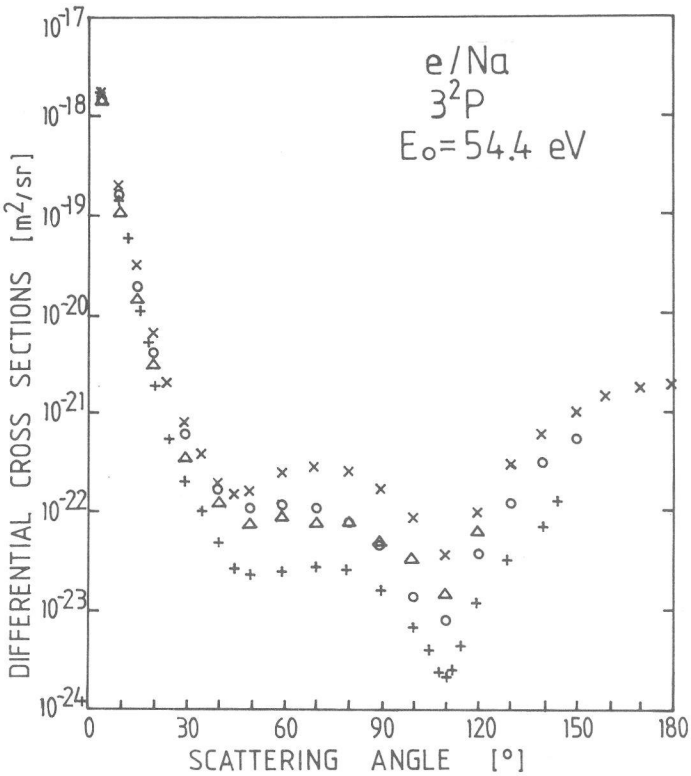
First, relative DCS for elastic and each inelastic feature were obtained. In these measurements checks were done to avoid double scattering, the beckground counts were substructed from signal, zero ange position was determined utilizing symmetrical count-rates of positive and negative scattering angles, and data were collected for three different distances of atomic source from the interaction region to check if there were irregularities in shape of atomic beam.

After that, relative cross sections up to 20° for the excitation of the resonant $3^2P$ state were convereted to generalized oscillator strenghts (GOS) which were normalized to optical oscillator strenght (OOS) for zero squared momentum transfer, $K^2 = 0$. Normalized GOS for the $3^2P$ state were then converted to absolute DCS. Absolute DCS for the elastic scattering and the other excited states were determined from intensity ratios to the $3^2P$ state.

The absolute DCS for the excitation of the $3^2P$ state is shown in Figure 1. Present result shows good agreement with the previous measurements of Srivastava and Vušković[3]. The experimental result of Buckman and Teubner[4] are lower then ours, while the theoretical result of Mitroy et al.[5] are above ours at larger scattering angles.

Present elastic DCS are in better agreemnent with the results of Teubner et al.[6] then with those of Srivastava and Vušković[3] although our DCS do not exibit so deep minimum at 110° as obtained by Teubner at al. Elastic DCS calculated by Mitroy et al.[5] are higher as compared to ours.

For the $4^2S$ state DCS are above those obtained by Srivastava and Vušković[3] and those calculated by Msezane et al.[7] but minimum at 110° is deeper in our measurements. There is no available data for DCS for the $3^2D$ and $4^2P$ states to be compared with.




o this experiment +Buckman and Teubner 1979

Δ Srivastava and Vušković 1980. x Mitroy et al. 1987.

All DCS were extrapolated to 180° and integrated to obtain absolute ICS, momentum transfer cross sections and viscosity cross sections.

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