



<b>Experiment title:</b> Comparison of experimental charge and momentum densities of $\text{Al}_2\text{O}_3$	<b>Experiment number:</b> HE-395
<b>Beamline:</b> ID15B	<b>Date of Experiment:</b> from: 1.7.98 to: 6.7.98
<b>Shifts:</b> 18	<b>Local contact(s):</b> T. Buslaps
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**Report:**

Compton profiles of  $\text{Al}_2\text{O}_3$  were measured using 30 keV and 58 keV radiation and the scanning spectrometer at ID15B. Three needle-like crystals were cut, and these were oriented to be perpendicular to the scattering plane, so that the crystallographic directions of interest could be aligned along the scattering vector by rotating the crystals about their axes. This ensured that the same geometrical conditions prevailed, and the contribution of multiple scattering was minimized. The momentum resolution in the 30 keV measurement was 0.1 a.u., and Compton profiles with  $5 \times 10^5$  counts at the Compton peak were measured for 8 crystallographic directions. Compton profiles for 2 directions were measured also with 58 keV radiation with lower resolution. This, however, was essential for understanding the separation of the electron core contribution from the total Compton profile, and for correct normalization of the data.

The experiment was very successful as more data of good statistical accuracy was collected than what was foreseen. Preliminary inspection of the data indicates good internal consistency. Analysis of the directional differences of the Compton profiles and spatial correlations of the electronic distributions in terms of the reciprocal form factors will be started soon. Theoretical Compton profiles will be calculated from the same wave functions that were used for calculation of the structure factors. This will allow for combination of information from Compton scattering measurements and single crystal diffraction studies.