Abstract

The scalar dipole polarizabilities, $\alpha E1$ and $\beta M1$, are fundamental properties related to the internal dynamics of the nucleon. The currently accepted values of the proton polarizabilities were determined by fitting to unpolarized proton Compton scattering cross section data. The measurement of the beam asymmetry $\Sigma 3$ in a certain kinematical range provides an alternative approach to the extraction of the scalar polarizabilities. At the Mainz Microtron (MAMI) the beam asymmetry was measured for Compton scattering below pion photoproduction threshold for the first time. The results are compared with model calculations and the influence of the experimental data on the extraction of the scalar polarizabilities is determined.