

# The OLYMPUS experiment

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## Abstract

The OLYMPUS experiment was designed to measure the two-photon contribution in elastic electron-proton scattering. Two-photon exchange could explain the discrepancy between the form factor ratio,  $\mu_p G_E^p / G_M^p$ , measured with polarization techniques and unpolarized experiments. To achieve this the OLYMPUS experiment used the DORIS storage ring at DESY with electron and positron beams at 2.01 GeV incident on an internal hydrogen gas target to measure the ratio in the elastic scattering cross sections for positrons versus electrons. The experiment used a toroidal magnetic spectrometer instrumented with drift chambers and time of flight detectors to measure the rates for elastic scattering over the polar angular range of approximately  $25^\circ$ – $75^\circ$ . To monitor the luminosity there was a symmetric Møller / Bhabha calorimeter and telescopes of GEM and MWPC detectors at  $12^\circ$ . A total luminosity of  $\sim 4.5 \text{ fb}^{-1}$  was collected. This letter gives a brief overview of the experiment and reports on the first results from the analysis.

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