

LATEST RESULTS FROM THE OLYMPUS EXPERIMENT

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The two experimental techniques for determining the proton's elastic form factors—unpolarized cross section measurements and polarization asymmetries—have yielded strikingly discrepant results. One possible explanation for this discrepancy is that hard two-photon exchange, a radiative correction that is typically neglected, contributes on the percent level to the elastic electron-proton cross section. The OLYMPUS experiment tests this hypothesis by measuring the ratio of positron-proton to electron-proton elastic scattering cross sections. Deviations in this ratio from unity are a signature of hard two-photon exchange.

The OLYMPUS experiment took place at DESY, in Hamburg, Germany, and over 4 fb^{-1} of integrated luminosity were acquired by the end of data taking in 2013. 2 GeV electron and positron beams, alternating daily, were directed through a windowless hydrogen gas target. Scattered leptons and recoiling protons were detected in coincidence in a toroidal magnetic spectrometer simultaneously over a wide range of angles. The relative luminosity between electron and positron modes was monitored redundantly through rates of both forward elastic and symmetric Møller/Bhabha scattering.

The latest results from the OLYMPUS analysis will be presented.