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TPEX@DESY - A Two-Photon Exchange Experiment at DESY[1]

DOUGLAS HASELL, Massachusetts Institute of Technology MIT, TPEX COLLABORATION — The striking discrepancy in the proton form factor ratio, $\mu_p G_E^p / G_M^p$, measured using unpolarized and polarized techniques is still not resolved. The proposed explanation is that hard two-photon exchange (TPE) is responsible. Hard TPE is difficult to calculate without significant model dependence, and has generally not been included as a radiative correction. Furthermore, three recent experiments found only a small contribution but were limited to relatively low Q^2 where the discrepancy is not clear. A new test beam experiment, TPEX@DESY, would use a planned extracted beam at the DESY test beam facility together with a liquid hydrogen target and high precision lead tungstate calorimeters to measure hard TPE at higher beam energies. This would permit measurements in a Q^2 regime where the discrepancy in the proton form factor ratio is significant and where the expected hard TPE contribution is predicted to be large. The motivation and overview of the proposed measurements will be presented.

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