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## Photopion physics at MAMI

*Monday, 29 June 2015 11:10 (40 minutes)*

Recent measurements and future plans for photopion experiments with the CB-TAPS detector system in the A2 hall at the Mainz Microtron will be presented. First, a measurement with linearly polarized photons and an unpolarized liquid-hydrogen target will be discussed. The beam asymmetry along with differential cross sections provide the most stringent test to date of the predictions of Chiral Perturbation Theory and its energy region of convergence [1]. Second, a more recent measurement was performed using both circularly polarized photons and a transversely polarized butanol frozen-spin target to extract the polarization-dependent differential cross section associated with the target asymmetry [2]. Results from both measurements have been used for a model independent determination of S- and P-wave multipoles in the  $\pi^0$  threshold region, which includes for the first time a direct determination of the imaginary part of the  $E_{\{0^+\}}$  multipole. Finally, plans for a novel  $\pi^0$  photoproduction measurement on  $^3\text{He}$  to obtain the elusive  $E_{\{0^+\}}$  multipole for the neutron channel will be introduced.

### References

1. D. Hornidge et al., Phys. Rev. Lett. 111, 062004 (2013).
2. S. Schumann et al., in preparation.

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