

# Photoproduction of mesons from quasi-free nucleons

*Thursday, 29 May 2014 12:00 (0:30)*

## Collaboration

## Abstract content

The investigation of the baryon states is important to understand the underlying nature/symmetries of hadronic matter. Historically, the first nucleon excitation experiments have been done using charged pion and kaon secondary beams. Later the antiproton-proton scattering have also been involved. However, since the beginning of the 90's meson photoproduction reactions have been considered as a powerful tool in baryon spectroscopy. Despite the great efforts the physical parameters of many well established states remain uncertain. Moreover, the existence of strong isospin dependence of the electromagnetic transition amplitudes can only be studied with meson photoproduction off the neutron. The final goal of this activities is to collect (almost) complete data sets, allowing PWA and the extraction of nucleon resonance properties without model dependent ambiguities. The experiments worldwide, are using virtual or real photon beams and measuring neutral or charged ejectiles. The large solid-angle EM calorimeters, Crystal Barrel/TAPS at ELSA (Bonn) and Crystal Ball/TAPS at MAMI (Mainz) are using real/tagged photon beams, whereas CLAS at CEBAF(JLab) and A1 at MAMI are utilizing high energy electron beams for virtual photon scattering experiments. "Unfortunately", the nonexistence of free neutrons requires the use of quasi free neutrons as targets(bound in the deuteron or the other light nuclei). The scientific programs of this experiments also include single and double polarization measurements. We will review the current status of these programs.

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**Session Classification :** Plenary Session