

Abstract Submitted
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Pion Identification in Photonuclear Measurements at MAX-lab

COLLEEN ALLEN, University of Massachusetts Dartmouth, MAX-TAGG COLLABORATION — One of the important questions in nuclear science is to describe the properties of the nucleon in terms of a QCD-based framework. In the low-energy nuclear region, the QCD calculations are impossible to do using standard techniques, so it is necessary to use alternate approaches. A process where these other techniques are both valid and useful is near-threshold pion photoproduction. This process involves a rearrangement of the quarks in the nucleon and thus is directly accessing the underlying quark structure. The newly upgraded tagging facility at MAX-lab in Lund, Sweden is capable of tagging photons at energies up to 200 MeV and is ideally suited for performing measurements of pion photoproduction in the energy range from threshold to the Δ -resonance. Standard ΔE vs. E particle identification methods are insufficient to separate the pions from the very large proton and electron background. By searching for the 4.12 MeV muon from pion decay in the E counter, it is possible to identify candidate pion events. A final cross-check of the pion identification is made by examining the decay curve for these candidate pion events. In order to determine accurate cross sections, it is necessary to correct the final pion yield for events lost through the particle identification cuts, as well as for the misidentification of background events as pions. The particle identification techniques and analysis will be shown.

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