

Abstract Submitted  
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**Measurement of the Total Cross Section for  $\gamma n \rightarrow \pi^- p$  Near Threshold at MAX-lab<sup>1</sup>** KHAYLA ENGLAND, University of Massachusetts Dartmouth, MAX-TAGG COLLABORATION — In nuclear science, researchers strive to describe the properties of the nucleons using the framework provided by QCD. A number of theoretical approaches, such as Chiral Perturbation Theory, can be used to solve the QCD equations for nuclear processes. The predictions of these theories can be compared with the results from experimental measurements for those nuclear reactions where both theory and experiment can provide accurate answers. One such reaction where this comparison is possible is pion photoproduction close to threshold. A measurement of the total cross-section very close to threshold for the  $\gamma n \rightarrow \pi^- p$  reaction is currently being performed using the Tagged Photon Facility at MAX-lab in Lund, Sweden. A LD<sub>2</sub> target was used to provide the neutron target. Due to the target thickness, the  $\pi^-$  were not detected directly but instead were captured on another nucleus in the target. This capture resulted in a nominal 128 MeV  $\gamma$ -ray approximately 25% of the time. This gamma-ray easily exited the target and was detected using three large NaI(Tl) detectors: CATS, BUNI, and DIANA. The  $\pi^-$  capture  $\gamma$ -ray is clearly seen in the data. An overview of the measurement and preliminary results will be presented.

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