

Abstract Submitted
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Analysis of $\gamma \text{ p} \rightarrow \text{p} \pi^0 \pi^0$ Reaction at CLAS¹ MIRANDA CARVER, Ohio University, CLAS COLLABORATION — Hall B of Jefferson Lab used the CEBAF Large Acceptance Spectrometer (CLAS) detector to study different properties of nuclear matter. One goal of studying nuclear matter is to understand the basis of the quark-quark interaction. Studying different particle reactions helps further this understanding, and adds to the overall knowledge of the field. The $\gamma \text{ p} \rightarrow \text{p} \pi^0 \pi^0$ photoproduction reaction was measured using the CLAS detector at Jefferson Lab, where all the particles were detected. The aim of this study is to investigate $\gamma \text{ p} \rightarrow \text{p} f_2(1270) \rightarrow \text{p} \pi^0 \pi^0$. The branching ratio of the $f_2(1270)$ to $\pi^0 \pi^0$ is 28%. The $f_2(1270)$ meson has been studied before but never via the $\pi^0 \pi^0$ channel. This channel is unique because it does not have a dominant ρ meson background which allows for the extraction of the $f_2(1270)$ signal easily. Data for photoproduction of the $f_2(1270)$ can be compared with theoretical calculations that include multi-gluon exchange between the incident photon and the proton target. By comparing data and theory, we will learn more about the role of gluons in the quark-quark interaction. In addition, the t distribution will be computed for photoproduction of the $f_2(1270)$ meson, over incident photon energies from 3.5 to 5.5 GeV.

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