Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

$\Theta^+$ Search in CLAS with $\gamma d \rightarrow pK^0sK^−(p)$

NATHAN BALTZELL, DAVID TEDESCHI, University of South Carolina, CLAS COLLABORATION — A search for photo-production of the $\Theta^+(1540)$ pentaquark in the $pK^0$ decay mode was performed with the CLAS detector at Jefferson Lab. About 20,000 $\gamma d \rightarrow pK^0sK^−(p)$ events with photon beam energies $1.6 - 3.6 GeV$ were fully reconstructed and kinematically fitted. To investigate the resonant backgrounds, a phenomenological model including hyperon and meson production has been developed and fitted to the data with a maximum-likelihood method. The model results serve as a background to evaluate the existence of a pentaquark signal in the invariant mass of the $pK^0$ system. The cross-section upper limit on $\Theta^+$ photo-production in this channel will be reported.

1This work is supported by grant 0244982 of the National Science Foundation.

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Date submitted: 29 Jun 2006

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