

# **Inclusive Nucleon Resonance Electroproduction at Large Momentum Transfer \***

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SLAC-Report-694  
1994

Prepared for the Department of Energy  
under contract number DE-AC03-76SF00515

Printed in the United States of America. Available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

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\* Ph.D. thesis, American University, Washington DC, 20016

INCLUSIVE NUCLEON RESONANCE ELECTROPRODUCTION  
AT LARGE MOMENTUM TRANSFER

by

Cynthia Keppel

submitted to the

Faculty of the College of Arts and Sciences

of The American University

in Partial Fulfillment of

the Requirements for the Degree

of

Doctor of Philosophy

in

Physics

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ABSTRACT

Measurements of nucleon resonance cross sections for large angle ( $14^\circ < \theta < 61^\circ$ ) electron scattering from deuterium and hydrogen are reported for incident energies of  $2 < E_0 < 9.75$  GeV. The data were obtained using the Nuclear Physics Injector beam at the Stanford Linear Accelerator Center (SLAC). Scattered electrons were detected in both the 8 GeV and 1.6 GeV spectrometers in End Station A. The experimental technique and the method of analysis are described in detail. The cross sections are used in conjunction with previous SLAC data to perform Rosenbluth separations and to measure the longitudinal component of the cross sections.  $R = \sigma_L/\sigma_T$ , the ratio of the longitudinal and transverse components of the cross section, is found to be small throughout the entire resonance region ( $1 < W^2 < 4$  GeV<sup>2</sup>). Some reanalysis of the older data is outlined. This reanalysis was also useful in developing a global fit to all available SLAC resonance region data. Results from this fit are presented along with both the new and older spectra. Possible evidence in the older data for the Roper  $P_{11}(1440)$  resonance is discussed. The Delta  $P_{33}(1232)$  resonance form factor has been measured and is found to fall off faster than  $Q^{-4}$ , but not as fast as had been previously observed.

## ACKNOWLEDGMENTS

This thesis is the result of numerous hours of love and labor and, although my name adorns the front page, a large number of these hours were not mine. I want to thank all of you who contributed to this effort. In particular...

I would like to recognize The American University group at SLAC - Ray Arnold, Peter Bosted, Steve Rock, and Zen Szalata. Every member of this group shared freely of their vast knowledge and talent, and of their limited time. The End Station A training ground is a good one. Thank you, Ray, for sharing your insight and infectious enthusiasm for this field. Thank you, Peter and Steve, for your guidance and patience. Your knowledge and dedication to my education made this thesis a reality.

Experiment E140X was the result of a collaborative effort of thirty-six physicists representing ten institutions. To Perry Anthony, Arie Bodek, Joe White, and every one else who contributed to the success of this experiment I offer my gratitude. I offer it also to the excellent technical support staff at SLAC including Martin Berndt, Jerry Davis, Bob Eisele, Carl Hudspeth, John Mark, and O. Katt.

Lisa Andivahis, Makis Petratos, and Linda Stuart were there when I had questions, concerns, troubles, and, well, were always there for me. Thanks to you all. Your big footprints made the path easier to follow. Thanks also to Michael Spengos and Ling Hong Tao, because it was nice to follow this path with kind companions.

Thank you, John Rand, for making the AU years a joy.

\Thanks to Pat Emslie for her TEXnical assistance. Pat, I will never make another table without thinking of you.

My colleague and friend Rolf Ent I want to thank immensely. I often utilized the 1-900-ASK-ROLF line. Expertise at the other end of a phone, questions entertained night and day. Also available: an unceasing supply of encouragement, enthusiasm, mirth, suggestions, and answers.

Naomi Makins I also must thank. A bond that began in optical glue and five minute epoxy became a friendship. Thanks, Gnome, for your understanding, brilliance, warmth, humor, poetry, everything.

To my mother and stepfather, Cynthia and Tazewell Rufty, and to my father David Keppel. For this one effort amongst the many I thank you all for, I thank you for your faith in me.

Finally, my husband, Barry Hellman, Jr. and my son, Barry Hellman III deserve far more than thanks. I hope that someday I have the opportunity to repay your indefatigable patience, understanding, confidence, and love. This effort would have been impossible and no fun without you.

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