SLAC-R-725

A Measurement of D+ and Ds Production in e+ e- Annihilation at $\sqrt{s}$ = 29 GeV

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SLAC-Report-725

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.

*Ph.D. thesis, University of Colorado, Boulder, CO 80309

A Measurement of D^+ and D_s Production in e^+e^- Annihilation at $\sqrt{s} = 29$ GeV

by

Derrell Durrett

B. S., Texas Tech University, 1986

A thesis submitted to the

Faculty of the Graduate School of the

University of Colorado

in partial fulfillment of the requirements for the degree

Doctor of Philosophy

Department of Physics

1993

This thesis for the Doctor of Philosophy degree by

Derrell Durrett

has been approved for the

Department of Physics

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Date April 26, 1993

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A Measurement of D^+ and D_s Production

in e^+e^- Annihilation at $\sqrt{s} = 29$ GeV

Thesis directed by Professor William T. Ford

Measurements have been made of the production rates of D^+ and D_s mesons via the channels $D^+ \to \overline{K}^{*0}\ell^+\nu_\ell$ and $D_s \to \phi\pi$ in e^+e^- annihilation at $\sqrt{s} = 29$ GeV in 220 pb^{-1} of data collected by the Mark II detector. The measurements assume the current branching ratios, measured predominantly at $\sqrt{s} \simeq 10$ GeV and by fixed target experiments. Measurements of the total production cross-sections times the appropriate branching ratios, which are independent of any other measurements, and an upper limit for the ratio of branching ratios, $\Gamma(D_s \to \phi\ell\overline{\nu}_\ell)/\Gamma(D_s \to \phi\pi) < .74$ at 90% confidence level are presented.

It is found that the production cross-section of D^+ mesons is $\sigma(e^+e^- \to D^+X) = .24 \pm .06 \pm .04$ nb while the production cross-section for D_s mesons is $\sigma(e^+e^- \to D_sX) = .10 \pm .04 \pm .03$ nb. This corresponds to $.23 \pm .06 \pm .06$ D^+/hadronic event and $.09 \pm .04 \pm .02$ D_s/hadronic event.

Part III, "Permanent Waves"

Science, like Nature
Must also be tamed
With a view towards its preservation
Given the same state of integrity
It will surely serve us well

Natural Science, by Neil Peart
from the LP Permanent Waves, by Rush
(1980)

I can live with doubt and uncertainty, I think it is much more interesting to live not knowing than to have answers which might be wrong. I don't feel frightened by not knowing things, by being lost in a mysterious universe [that is] without any purpose, which is the way it really is, so far as I can tell. It doesn't frighten me.

— Richard P. Feynman
1918-1988

ACKNOWLEDGMENTS

This thesis, and many others, would not have been possible except for the combined efforts of many people. First, the Mark II Collaboration, which, in its many incarnations built and operated the detector, wrote software, and pored over output. It is their work I have built from, especially those who worked on lepton identification. Specifically, I would like to thank René Ong, Andrew Weir, Paul Weber, and Dean Hinshaw. I have never met René or Andrew, but they have been willing to help via E-mail even though they didn't know me from Adam. Paul and Dean were always helpful, with everything from teaching me to operate the detector to helping me to understand the CUTHESIS macros to leading me through the maze of software. Tricia Rankin was a joy to work with despite the absurdity and drudgery of spending six hours at a time on the phone with someone half a continent away to solve a problem that turned out to be an extra piece of hardware. Spencer Klein deserves special mention for posing the problem of D_s decays when there were no obvious choices for a thesis, and not much hope for data from the SLC. He has been enormously helpful and demonstrated keen insight, many times helping me to understand and better define the problems I faced. Charlotte Hee has also helped in innumberable ways, even though she has never met me, in tracking down problems in the Mark II software. My advisor, Bill Ford, deserves many thanks for taking me on as a student when he did. I've been a burden, being so late in finishing, and he certainly didn't have to take me on when I needed out of a really tight spot. And last, though hardly least, I owe some debt of gratitude to the taxpayers of the United States and the state of Colorado, who, through the Department of Energy and the University of Colorado, have financed my education as a physicist. *Muchas gracias.*

I thank Will Johns, Steve Culy, and John Cumalat of E-687 for many stimulating physics discussions, often giving me new insights into my own analysis. Also, I want to thank Tom deGrand and Jimmie Lees, the best of the many fine teachers I have had over the years.

One's time in graduate school is certainly not *all* work, though, and I definitely owe a debt of gratitude to so many people who've made my time in Boulder and California not just bearable but fun, not just worthwhile, but exciting. In Boulder: Matt Kohler,

and Bill Hovingh, for their friendship and seemingly endless and stimulating discussions about, well, everything; Susan Hoffmeister for her friendship, support (especially when I thought I was getting tossed out), and a fabulous summer exploring the Bay Area; Steve Culy, for (re)introducing me to TaeKwon-Do, the CU TaeKwon-Do Club and still more hours of cussing and discussing, despite his frightfully accurate prophecy concerning me; Ray Ladbury, Janice Enagonio, and Rich Loft, for fobbing off the mantle of HEP graduate students on me (I wonder who I can dump it on?); Mark Eickhoff for several 14ers; Will Johns for many more hours of talking, especially about our fates; and the many, many people who play Ultimate here in Boulder. In California: my D&D buddies, Anthony Szumilo (who also wrote a fabulous editor), Terry Reeves, and Steve and Sheila Meyer (*¡Viva la California!*); Alice Bean and Jenny Huber, who, besides being good friends, turned SLAC, and me, on to Ultimate, and the rest of the SLAC Ultimate crowd; Tony Johnson for his legendary parties, including a special one where I met my wife (did it have to be on Tax Day?); Ray Cowan, for his TEX genius, without whom this thesis would be ugly, not just dull; and Jan Lauber, who saved me by moving to California just as I thought I might go insane and axe murder my housemates, giving me a really good excuse to move out (did you ever tell Christine and Udo I was joking?). Several other people deserve mention just on general principles, including Margrét, Sherri, Keith, Ray, Kerry, Heather & Dave, Michelle, Angela, Don (the Juan), Rob (Grrrr! Yeah? Yeah!), Mike, and Shep. Also thanks to the Dallas Cowboys (*finally* another Super Bowl!), Chicago Cubs, Colorado Buffaloes (1990 NCAA College Football Champs!), Texas Tech Red Raiders (nevermind football, how 'bout the women's basketball team? National Champs in 1993!), and, believe it or not, the Menlo College Fighting Oaks (who provided live football at a time when I really needed diversion) for making me hoarse on many an afternoon (nevermind either that my cats are afraid of me and my wife's hearing is shot) and thanks to Asparagus Nightmares, Small Dog Warning, KFJC, KTCL, KBCO, and KFMX for many weird nights. My (once) 1982 Schwinn LeTour, which is now more a hodgepodge of bike parts than a well-thoughtout bicycle, deserves credit for many hours of enjoyable though exhausting hill-climbing and the resulting few minutes of thrills coming down, even if the frame may not take too many more of those. At least we

made it to the beach.

It is imperative that I thank my parents, Bob and Carolyn, who have always encouraged and supported me, often when they didn't have a clue what I was talking about, and sometimes even when they did. Just for that they deserve recognition.

Finally, I want to thank my wife, Teresa, for all of her love, support, and homemade beer. Maybe I could have done this without her, but I don't even want to think about having tried. The last four years have been unbelievably wonderful. Now that the spectre of graduate school no longer hangs over my head, perhaps I can *really* enjoy her company, and finally start cooking her dinner again.

Waitaminnit. Just one more thing: I seem to be the last Mark II graduate student to graduate, having squeezed out what little blood I found left in the turnip. *Ça alors*, I guess someone has to turn out the lights...

(click!)

Peace, ya'll.

CONTENTS

TABLES

Table

FIGURES

Figure