

# Lawrence Berkeley National Laboratory

## Recent Work

### Title

STUDY OF  $u\bar{u}$  AND  $f\bar{f}$  PRODUCTION AT 3-7 GeV/c

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### Publication Date

1970-02-03

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Abstract Submitted  
for the

Washington  
Meeting of the American Physical Society

April 27-30, 1970

Physical Review  
Analytic Subject Index  
Number 63.8

Bulletin Subject Heading  
in which Paper should be placed

Elementary Particles and  
Fields

Study of  $\omega^0\Delta^{++}$  and  $\rho^0\Delta^{++}$  Production at 3.7 GeV/c.\*

G. S. ABRAMS, W. R. BUTLER, D. G. COYNE, G. GOLDHABER, B. H. HALL, J. MACNAUGHTON, G. H. TRILLING, Lawrence Radiation Laboratory, Berkeley.--A study of the reactions  $\pi^+p \rightarrow p\pi^+\pi^+\pi^-$  (15 000 events) and  $\pi^+p \rightarrow p\pi^+\pi^+\pi^-\pi^0$  (16 000 events) has been made using a separated  $\pi^+$  beam at the Bevatron with momenta spanning the interval 3.7-4.0 GeV/c. The exposure in the LRL 72-inch hydrogen bubble chamber of 180 000 pictures has yielded 3000  $\rho^0\Delta^{++}$  and 2000  $\omega^0\Delta^{++}$  events. We find that  $\rho_{00}(\frac{d\sigma}{dt})$  dominates both reaction cross sections, implying for the  $\omega^0\Delta^{++}$  reaction the importance of amplitudes other than those expected from the leading Regge singularity (for the  $\omega^0\Delta^{++}$  reaction the  $\rho$  trajectory). The decay distributions as functions of  $t'$  ( $= t - t_{\min}$ ) are shown to be rich in structure; e.g., dips in  $\rho_{00}(\frac{d\sigma}{dt})$  near  $t' = 0$  and  $t' = -0.18$  (GeV/c)<sup>2</sup> are found for the  $\omega^0\Delta^{++}$  reaction, and a dip in  $\sigma_1^+ = (\rho_{1,1} + \rho_{1,-1})/2$  near  $t' = -0.2$  appears in the  $\rho^0\Delta^{++}$  reaction. Accommodation of our results within various Regge models will be presented.

\*Work supported by the U. S. Atomic Energy Commission.

<sup>1</sup>G. Goldhaber et al., Phys. Rev. Letters 23, 1351 (1969).

Submitted by

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UCRL-19473  
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