

An Experimental Survey of
Positron-Electron Annihilation into
Multiparticle Final States in the s Range 27 to 74 GeV²

A. M. Boyarski, M. Breidenbach, F. Bulos, G. Feldman, G. E. Fischer, D. Fryberger, G. Hanson, Rudy Larsen, H. L. Lynch, D. Lyon, C. Morehouse, J. Paterson, M. L. Perl, B. Richter, R. F. Schwitters(SLAC); and
G. S. Abrams, D. Briggs, W. Chinowsky, C. E. Friedberg, G. Goldhaber, R. J. Hollebeek, J. A. Kadyk, A. Litke, G. H. Trilling, M. Sadoff, B. Sadoulet, J. S. Whitaker, J. E. Zipse (LBL)

Summary

This is a proposal to make accurate measurements of the total cross section for $e^+ e^-$ annihilation into multihadronic final states as a function of center of mass energy. The value of the single photon annihilation total cross section is of vital interest to the understanding of the mechanism of hadron production. Recent measurements of this quantity at low energies have led to questions regarding the fundamental understanding of the process. High precision measurements at high energies will remove some kinematical uncertainties in interpreting low energy data as well as greatly extending tests of ideas related to scaling. Measurements of the charged multiplicity of the reaction will also shed light on various models of hadron production. In addition these measurements will provide a search for heavy leptons into a range not previously accessible.

By looking at specific products of the annihilation detailed studies can be made regarding scaling. In particular inclusive spectra will be measured over a wide kinematical range, but concentrating on the deep inelastic region. At the center of mass energies available in this experiment an inclusive measurement is feasible for baryons and hyperons.

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