

**PROPOSALS FOR INITIAL ELECTRON SCATTERING EXPERIMENTS  
USING THE SLAC SPECTROMETER FACILITIES**

Submitted  
By  
**SLAC-MIT-CIT Collaboration**

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## INTRODUCTION

Group A at SLAC has the major responsibility for the construction of the SLAC spectrometer facilities and for the positron source. Four other groups are involved in the design and construction :

SLAC Group C	(Richter)
SLAC Group F	(Ritson)
MIT	(Friedman and Kendall)
CIT	(Peck and Pine)

All of these groups intend to use the facilities for experiments after the completion of construction. These proposals are presented by the members of SLAC Group A, MIT and CIT whose initial interest is in electron and positron scattering experiments using the 8- and 20-BeV/c spectrometers. These two spectrometers have been designed for the general problem of detecting single particles with high resolution in both momentum and production angle. The kinematics of the two-body (or quasi two-body) states can thus be accurately defined.

We are submitting three proposals:

- I. Electron-proton elastic scattering
- II. Electron-proton inelastic scattering
- III. Comparison of positron-proton and electron-proton elastic scattering.

They are presented together, as much of the information developed applies to all of these experiments. The proposed measurements will act as a shakedown of the spectrometers for scattering experiments and provide a general survey of the basic cross sections which will be useful for future proposals.

The elastic scattering of electrons should be an early experiment on the 8-BeV/c spectrometer, particularly as it is a relatively straightforward way to check out and debug the rather complex data recording system. The positron scattering experiment will impose fairly stringent requirements on the positron beam and part of the time requested will be used for understanding and improving the positron source. The inelastic scattering experiment is intended as a survey experiment to demonstrate the usefulness of the SLAC accelerator in

this field. The study of backgrounds and radiative processes is important as it provides a guide to the future experimental progress at SLAC.

We are presenting each proposal separately, with the major apparatus described in the appendices at the end. We expect that most of the members of the groups will be involved in the electron-proton elastic scattering experiment, and that the other two experiments will be done by subgroups of the proposers. Other proposals in preparation by the group will be submitted by those physicists intending to carry out the particular experiments.