

### **Helicity Structure of Pion Photoproduction**

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#### *ABSTRACT*

The physics case for an experimental measurement of the helicity asymmetry in the two single-pion photoproduction processes  $\gamma p \rightarrow \pi^+ n$  and  $\gamma p \rightarrow \pi^0 p$  at energies up to 2.3 GeV is just as valid today as it was when Proposal 91-015 was originally submitted. Although an extensive set of measurements on these reactions has been completed at Mainz at energies up to 800 MeV, no helicity-separated exclusive data exist above 800 MeV, and none are anticipated at other laboratories in the near future. The data are an important input to the partial-wave analyses of pion photoproduction, and the helicity-separated angular distributions will be important in making acceptance corrections to the ongoing program of measurements of the GDH sum rule by the total cross section method at Bonn and other laboratories. We request that the approval of the experiment be reaffirmed for the next 3 years, during which time we are confident that a suitable polarized target can be obtained and the experiment can be completed.