



**national
accelerator
laboratory**

Author Richard Wilson
Date July 22, 1968

Section Summer Study
Category 2020

Page 1 of
Serial TM-72

Subject

COMMENTS ON "THE ELECTROMAGNETIC FORM FACTOR
OF THE CHARGED PION" BY J. A. POIRIER

(1) The liquid H_2 target is not essential. Beryllium does almost as well on electron/nucleon. θ^2 has a low radiation length.

There is no point in reducing target thickness below 0.02 radiation lengths because of radiative corrections. The hydrogen, however, has the merit of reducing background. A negative pion is not produced in $\pi^+ p$ collisions until three pions exist in the final state.

(2) In the beam we might use wire spark chambers operated in the proportional mode--as Charpak has developed. This can operate at a high beam intensity.

(3) We need either a scintillation or proportional counter to check on two outgoing particles from the target (not one). Due to Landau straggling, it is not possible to exclude three.

(4) I prefer a Hofstadter type NaI absorption counter to the lead/scintillator sandwich because of its superior pulse height-resolution.

(5) The anticounter must be large enough to exclude all outgoing particles which are not in the forward direction. It can be fat enough to convert $\pi^0 \gamma$ rays and/or neutrons. Then the only backgrounds are $\pi^+ p \rightarrow \pi^+ \pi^- \pi^+ N$; π^- masquerades as an electron. N has too low an energy to be detected in the anti-counter.

This is clearly small.