

2.3 Direct Photons - Two Approaches

L. R. Cormell, University of Pennsylvania

We have considered two approaches to the study of direct photons at the Tevatron. The first approach, as presented by C. Bromberg, is designed to maximize the direct photon detection while sacrificing some efficiency in jet detection. The second approach, as discussed by several of us in the group, is presented in the next section by D. McLeod. This second approach has the advantage of coupling a large solid angle jet calorimeter with the direct photon detector. It has been recently suggested that the measurement of jet-photon correlations at large p_T will provide greater information than the measurement of γ/π^0 .^{1,2}

The apparatus as proposed by Bromberg is shown in Fig. 1. It consists of a magnetic spectrometer for measurement of the charged particles in the jet, and three large cylindrical liquid argon shower detectors. The liquid argon detectors are segmented into octants and are further subdivided into a large number of strips as seen in Figure 2. This distributed system has the virtue of being able to withstand a large interaction rate--perhaps as high as 10^7 interactions/sec. A detector of this type should be able to measure the γ/π^0 ratio out to a p_T of about 10 GeV/c. A disadvantage of this apparatus is that the jets will not be observed in a bias-free way.

References

1. L. Cormell and J. F. Owens, Phys. Rev. **D22**, 1609 (1980).
2. J. F. Owens, in the proceedings of this workshop.

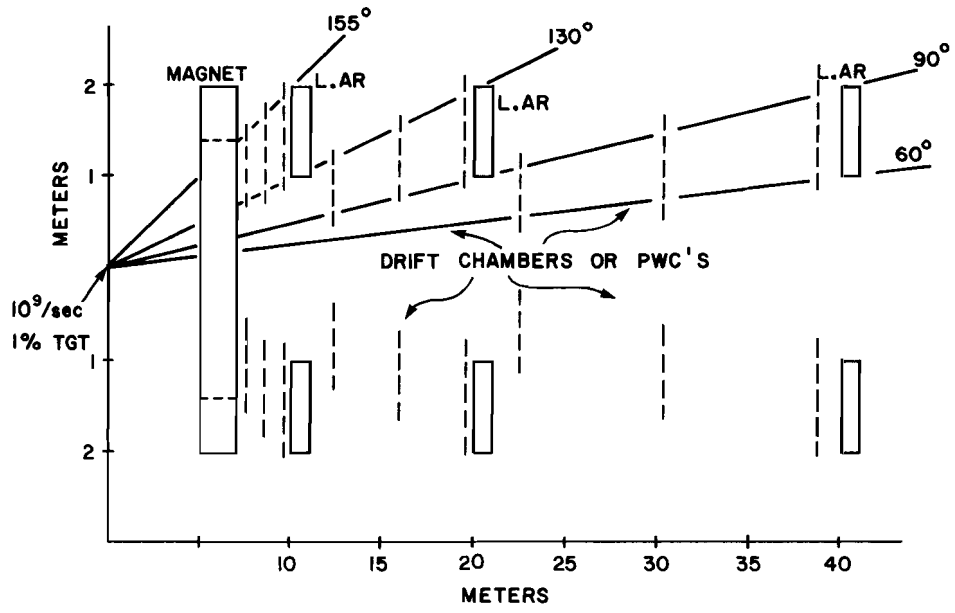


Fig. 1. Liquid argon direct photon detector $(s)^{1/2} = 39$.

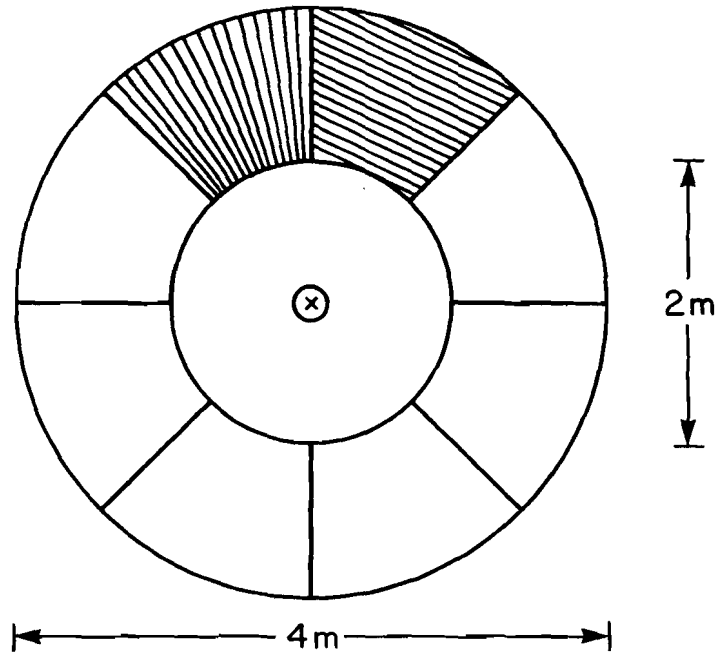


Fig. 2. Beam view of liquid argon detector.