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TEST OF THE EXTERNAL MUON IDENTIFIER EFFICIENCY

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NAL Proposal: Test of the External Muon Identifier Efficiency

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We wish to measure the EMI efficiency at hadron momenta higher than the 3 GeV used at the Beavatron.¹ We propose to use the 30 M^3 bubble chamber as the momentum and spatial analyzer of charged hadrons both of the incident beam and those final state hadrons of interactions that occur within the chamber. We would use the EMI modules as mounted on the bubble chamber vacuum tank (see Fig. 1) to measure the efficiency of the EMI absorbers (coils and zinc) over a wide range of momenta. A hadron signature would be either the lack of a proportional chamber (PC) encoding within the "96 °/o muon-circle"^{*} or a multiple PC encoding. We shall attempt to identify π - μ decays in the chamber to use as a source of muons.

Such a test would give us experience in spatially reconstructing tracks within the chamber and in projecting their trajectories out to the EMI detector modules.

The early portion of this test could utilize whatever hadron beam the NAL bubble chamber group would be using at the time. We would

96 $^{\circ}/_{\circ}$ of the multiple scattered muons fall within this circle.

make a copy of an adequate number of the original frames and compare the film quality with the original ones to test whether the EMI experiments of any sort, neutrinos or hadrons, could use copies rather than the original film negatives. The later portions of the test may require incident beams of momenta and particles of our choosing. Approximately 10⁴ interactions would be needed for the early test.

References:

 Muon Identification Using Multiwire Proportional Chambers TM358, LBL 796, UN-511-121-72, F.A. Harris, S.I. Parker, V.Z. Peterson, D.E. Yount, and M.L. Stevenson.

