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EXPT P189
Beam H8
Status: Recommended for approval by SPSC

LEPTON PRODUCTION

Collaboration

Brookhaven National Lab (BNL), CERN, Heidelberg University, Lebedev Institute, Novosibirsk Institute of Nuclear Physics, Lund University, Moscow Physical Engineering Institute (PEI), Rutherford Appleton Labortory (RAL), Syracuse University, Tel Aviv University.

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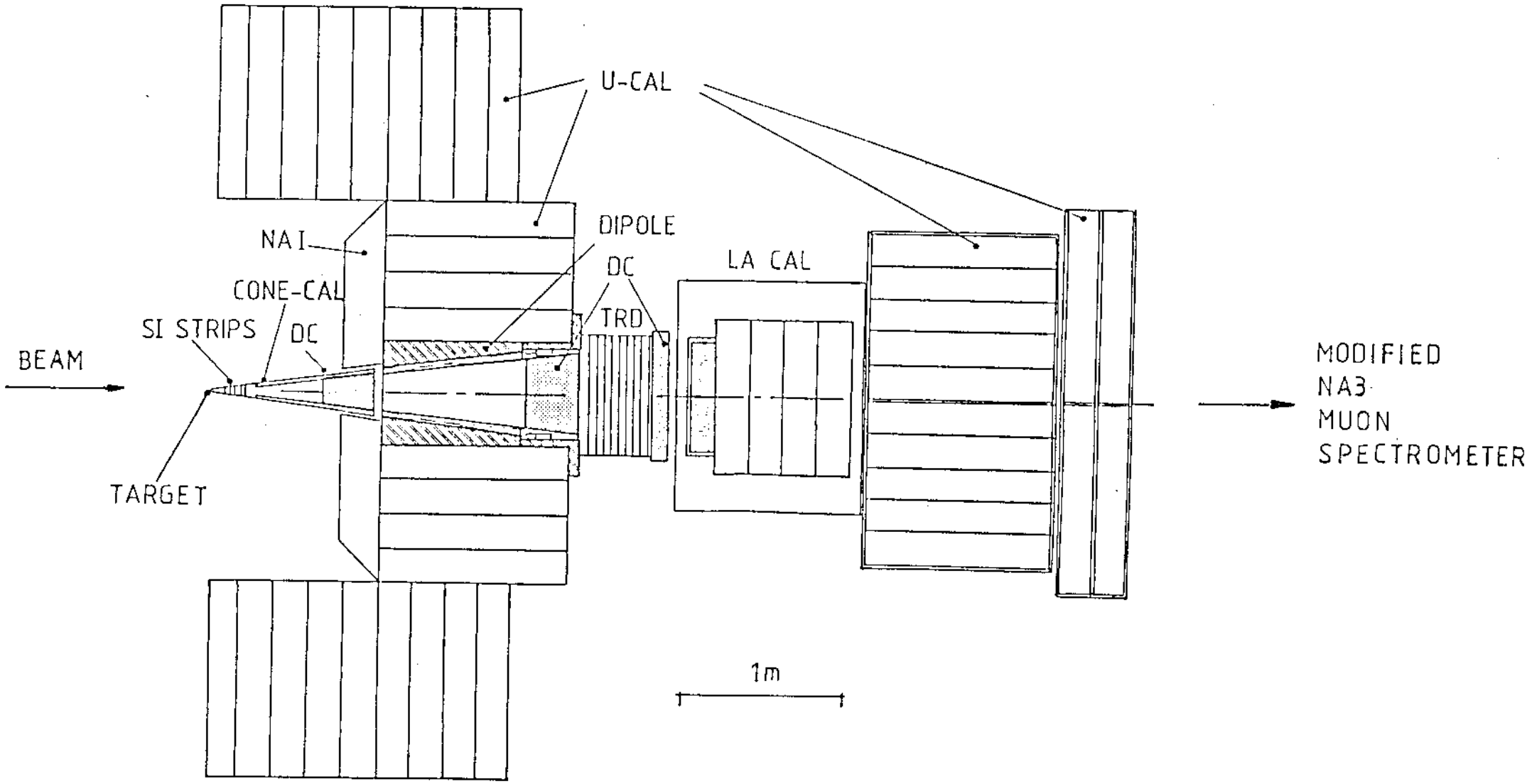
This experiment aims to settle open questions in the hadronic production of electrons, muons, and neutrinos. Prominent among these are e/μ universality, anomalies in the production of single leptons, the contribution of charm decay to lepton pair production, and the "anomalous" low mass pairs.

The experimental design aims to optimize the combination of:

- electron identification (background $< 10^{-6}$)
- muon identification (background $< 10^{-5}$)
- missing energy measurement for neutrinos ($\Delta E/E \sim 1.3\%$ for $E \sim 450$ GeV)
- vertex identification (for $\tau \sim \tau_{charm}$).

The upstream part of the apparatus is shown in the figure. In the vertex region a proton beam of transverse size $\sim$ 50 μ impinges on a beryllium target of diameter 50 μ, and high precision tracking in the vertex region is achieved by silicon strip detectors. Charged particle momenta are measured using a dipole magnet and high resolution drift chambers. Electrons are identified by the combination of the transition radiation detector and the finely segmented front section of the Uranium/Liquid Argon calorimeter. Essentially the complete centre of mass solid angle is covered by the Uranium/Scintillator and Uranium/Liquid Argon calorimeters. Further downstream muons are identified and measured in a modified version of the NA3 muon spectrometer (not shown in figure).

As an example of the kind of precision obtainable, we expect to test eμ universality in D decay to $\sim$ 1%.


U-CAL
NAI
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