

NEUTRINO BEAMS WORKSHOP

Stephen Pordes, Linda Stutte, and Frank Taylor*

A workshop on neutrino beams at the Tevatron was held at Fermilab on November 23, 1982, and was attended by a representative group of users of these beams. The purpose of the workshop was to discuss the various neutrino beam options which will be available at the Tevatron, with some emphasis on the technical aspects of monitoring the flux of these beams.

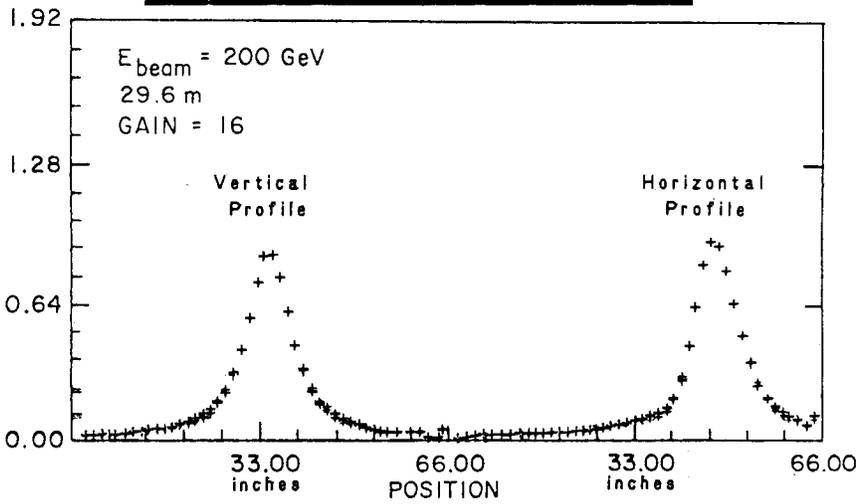
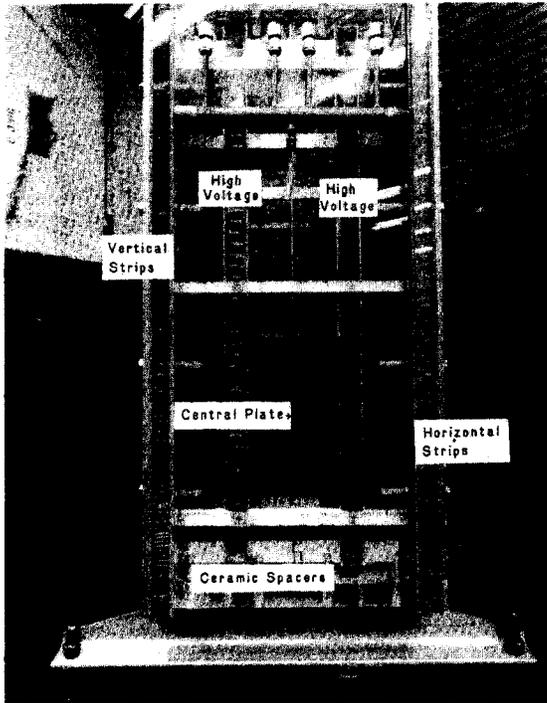
After the workshop was opened by Ken Stanfield, head of the Experimental Areas Department, there was a presentation of the predicted operating characteristics of the conventional ν_μ , $\bar{\nu}_\mu$ neutrino beams presently under construction. These beams are the quad-triplet wide-band beam and the narrow-dichromatic beam and were discussed by Linda Stutte. James K. Walker showed the current plans for the dedicated 'prompt neutrino' beam, which should provide a useful flux of other neutrino flavors, such as $\nu(\bar{\nu})_e$, $\nu(\bar{\nu})_\tau$ as well as the conventional $\nu(\bar{\nu})_\mu$ flavors.

A discussion of the flux monitoring techniques in the narrow-band beam was introduced by Stephen Pordes. Various technical aspects of this problem involving the operation of the Cherenkov counter, ion chambers, rf cavity, and the large ion chambers for the muon-flux measurements were presented by Dan Owen (E-594), Petros Rapidis (E-616, 701), Randall Pitt (E-594), and Carl Haber (E-701), respectively. The CERN experience in monitoring the wide-band neutrino flux was summarized by Vince Peterson, and Herman White discussed a scheme based on the large ion chambers which might be used to monitor the wide-band beam for Fermilab. The plans for hadron/muon calibration beams to the Neutrino Area were described by Ray Stefanski, and Taiji Yamanouchi outlined the latest schedule of the neutrino program at Fermilab.

The last portion of the workshop was devoted to a possible high flux broad-band neutrino beam which could be made by extracting protons from the old Main Ring at 150 GeV, while the Tevatron is either in collider mode, or between Tevatron spills for the fixed-target program. Some of the physics options and technical aspects of building and operating such a beam were discussed by Ray Brock and Roger Dixon.

There was much stimulating discussion of the technical problems of monitoring the flux of the narrow-band beam at the Tevatron and of the experience of monitoring the flux at 400 GeV. The workshop brought together several interested parties and gave everyone a sense of the problems and technical challenges of the beam-line part of doing neutrino physics at the Tevatron. Sets of transparencies from the talks are available from Stephen Pordes.

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One of the ion chambers used to measure the muon-flux in the neutrino beam, and a typical muon-flux profile.
(Photograph by Fermilab Photo Unit)