



A MODIFIED TRIPLET TRAIN FOR SIGN-SELECTED,  
BROAD BAND NEUTRINO EXPERIMENTS

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The quadrupole triplet train has been used by neutrino experiments that require an enhanced high energy flux with a simultaneous suppression of low energy neutrinos. The triplet, however, focuses particles of positive or negative charge with equal efficiency, and therefore offers no separation between neutrino and antineutrino in the final beam. This is a severe limitation in the study of neutral current events, because the final state lepton cannot be measured to fix the lepton number for the interaction. To remedy this deficiency in the beam we propose the addition of a sign-selector to the triplet train consisting of a set of bends placed immediately downstream of the focusing triplet line.

A schematic drawing of the train is shown in Fig. 1. A set of dipoles are used to separate the positive and negative components of the beam. The positive beam, including the primary proton beam, is then aborted in a beam stop; The negative beam passes through a second set of dipoles for some momentum recombination and steering into the decay pipe. Alternatively, the positive beam can be transported to the decay pipe by dumping the primary beam into

the beam stop as shown in the figure. Although this arrangement is designed primarily to facilitate neutrino experiments, the secondary beam can also be transported to the muon lab where it can be used for either muon or hadron experiments.

We have given here the explicit calculations for the anti-neutrino separated beam since this is the more difficult to achieve. The results are shown in Fig. 2 for a beam that is tuned for 200 GeV secondaries. The beam gives a  $\bar{\nu}/\nu$  ratio of about 10 over the entire spectrum of energies. There is an overall loss of about 30% in  $\bar{\nu}$  flux when compared to the original triplet beam. Fig. 3 gives the corresponding flux curves for the neutrino separated beam.

25 Sign-Selected Beam

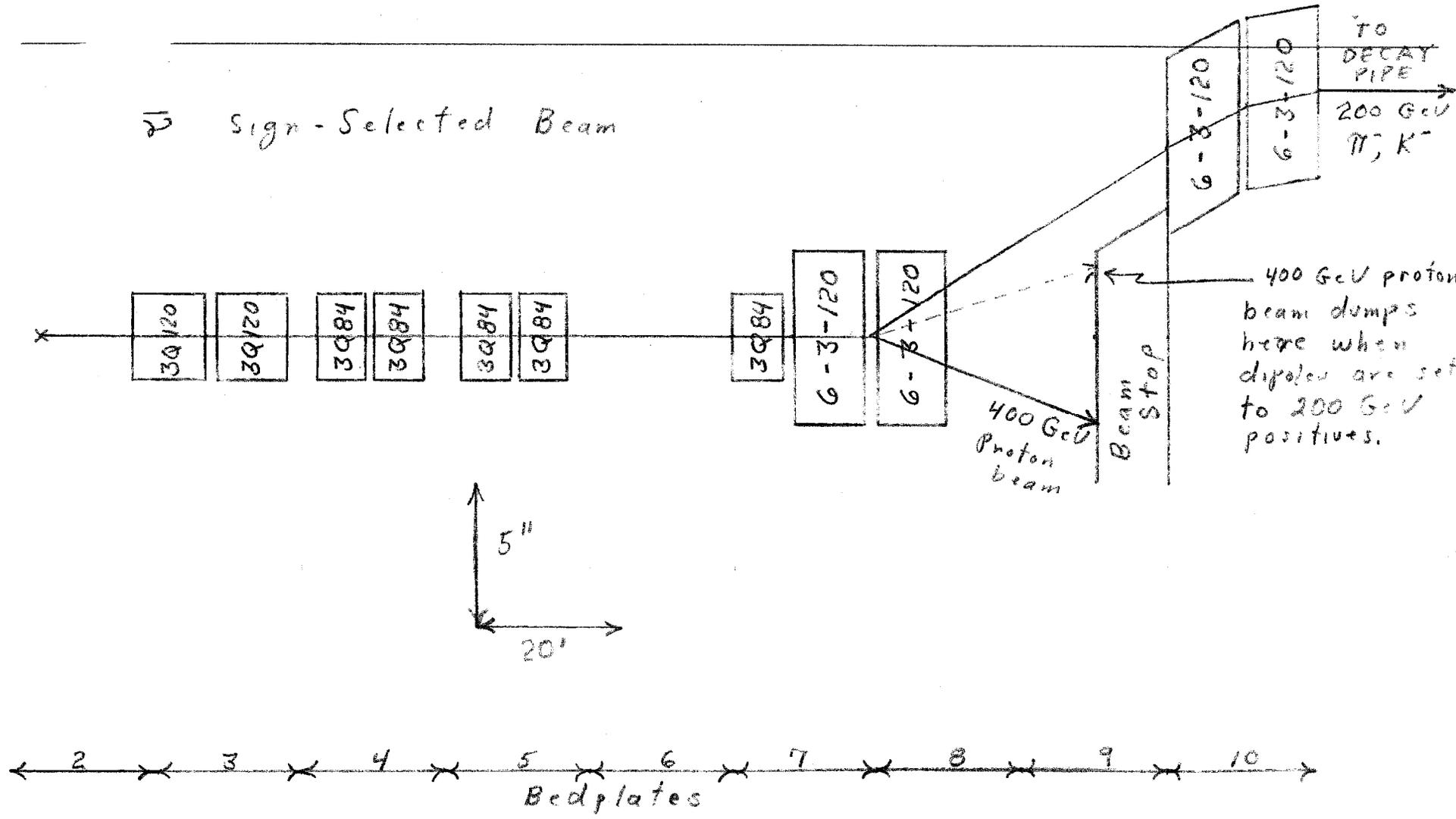


Fig 1

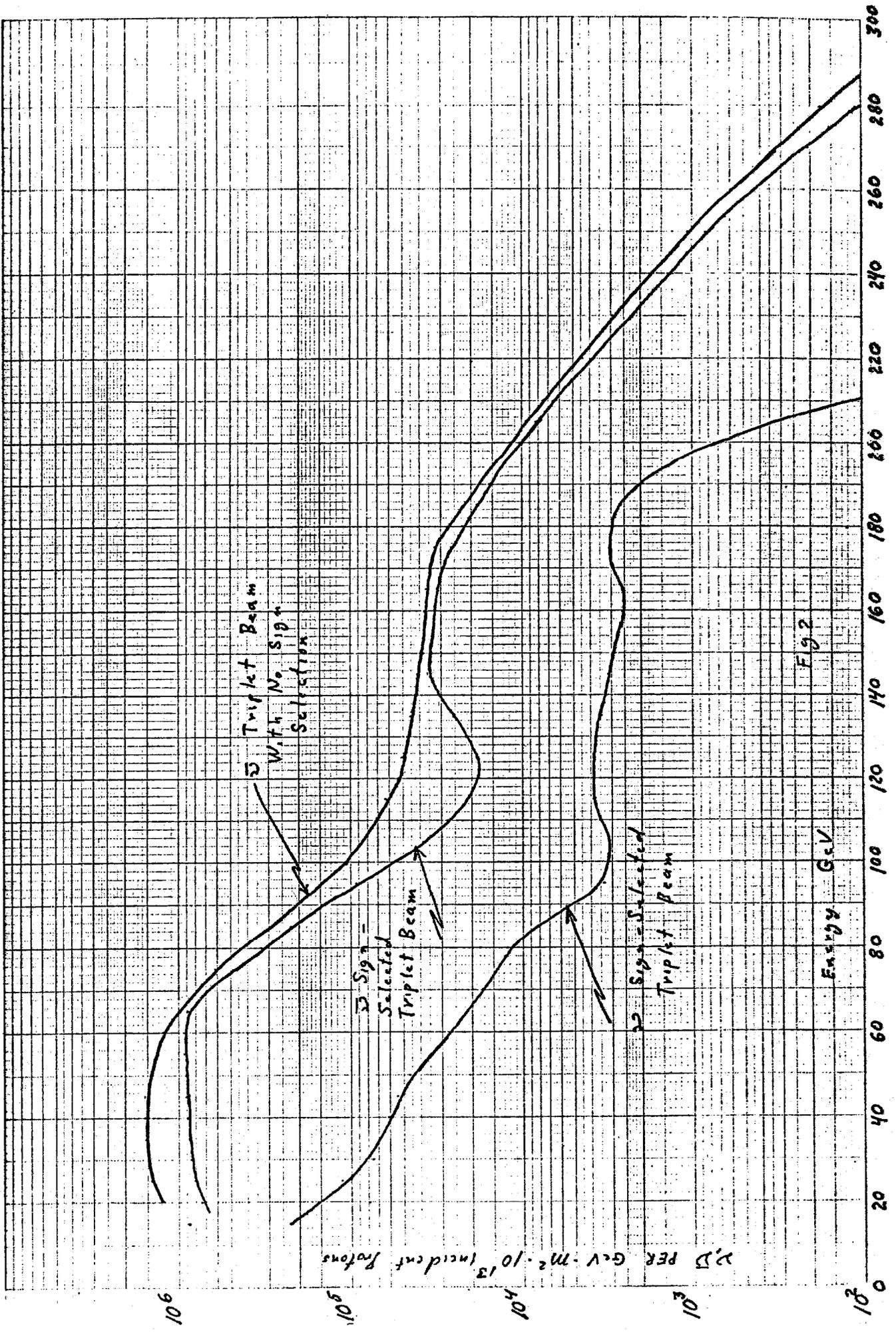


Fig 2

