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M E M O R A N D U M

To: The members of the SPSC

From: CERN-Dortmund-Heidelberg-Saclay Collaboration

Subject: Proton beam intensity in periods 7 and 8 for
the narrow-band neutrino beam

This memo is in response to the question by E. Lohrmann on the relevance of high proton intensity for the work to be done during the next few SPS periods.

The WA1 neutrino detector has been operational since January, 1977. The concept of the experiment is based on the use of the narrow-band neutrino beam for a systematically reliable study of charged and neutral current neutrino interactions. So far, however, the narrow-band beam running has been limited to the first half of 1977 at a time of low proton intensity and SPS reliability. The narrow-band beam has been in operation again since August 1978. Data were taken predominantly with neutrinos (20 days), and antineutrinos (10 days) with scheduled proton intensities between 4×10^{12} and 6×10^{12} protons per burst. Extended running of the antineutrino beam is still outstanding.

Both neutrino and antineutrino data are required simultaneously in order to allow the unfolding of the three independent structure functions. The statistics of antineutrino data are of course affected by the smaller antineutrino flux and the smaller cross-section. A substantial fraction of the total running time would be required to complement the neutrino data.

A two to one ratio between antineutrino and neutrino running has been accepted as a compromise between this and other considerations. Most of the remaining time this year should therefore

be scheduled for antineutrinos. In planning the running conditions for the narrow-band beam we have implicitly assumed that the proton intensities available will be maintained at the present level. It is clear that the relatively low statistics of the antineutrino data would be the first to suffer from a significant reduction of the proton intensity on target T11.

On the whole we feel that the narrow-band beam has not been favoured by the schedule. A further compromise in proton intensity would hit the neutrino programme unfavourably at a time when event rates are minimal due to the reduced neutrino flux of the narrow-band beam.