

CERN LIBRARIES, GENEVA



CM-P00045149

CERN-SPSC/83-33
SPSC/M355
10 May 1983M E M O R A N D U M

To: J. Lefrançois - SPSC Chairman
From: CHARM Collaboration
Subject: WBB Operation in 1983

Following our memorandum (CERN/SPSC/82-65; SPSC/M339) on our neutrino beam time request for 1983 and our status report given at the 90th meeting of the SPSC on 9 November 1982, you announced in a letter to our spokesman that the Committee had decided to allocate 5 x 17 days to WBB operation in 1983, after 27 days of NBB running requested by other users.

We would like to stress that the conditions of operation of the WBB are important for our $(\bar{\nu}_{\mu})_e$ scattering experiment. As indicated in SPSC/M339 and in the open presentation, the optimum conditions for this experiment would be satisfied with the SPS operating at 400 GeV with the highest repetition rate. We recognize that the North Area users of the SPS would like to have protons of 450 GeV, thus requiring the SPS to operate at this new higher energy and with a lower repetition rate. However, we would still propose operation of the ejection to the neutrino area at 400 GeV, since the higher energy, whilst providing a small increase in total flux per interacting proton ($\sim 20\%$), will produce an increase in the $(\bar{\nu}_e)$ background due to the enhanced K^{\pm} production. The loss of protons from the reduced repetition rate should be compensated by an increase in the fraction of protons given to the neutrino ejection.

Other users, who did not request WBB operation as their first priority, are now requesting to the coordinator that the WBB be operated at 450 GeV. Furthermore, in order to be protected against possible muon background leaking through the earth shield outside the steel plug, they are requesting that the beam be equipped with collimators to reduce the parent particle

acceptance at angles above 5 mrad. Such collimation reduces the total flux of neutrinos and would reduce the event rate for the $(\bar{\nu}_{\mu})_e$ experiment by a factor 1.38 in the case of neutrino operation and by a factor 1.7 in the case of antineutrino operation, compared with the fluxes without this extra collimation (see report by A.E. Ball, CERN/EP/NBU 82-4). Since high-energy K^{\pm} are not significantly reduced by this collimation, the relative $(\bar{\nu}_e)$ background would be further increased.

To conclude, we re-iterate our request already made in SPSC/M339 and in the open session of the 90th Meeting of the SPSC for $6 \cdot 10^{13}$ protons on target at 400 GeV shared in the ratio $\bar{\nu} : \nu = 2 : 1$. To have any hope of achieving this exposure in the 5 x 17 days allotted to WBB operation, we request that if the SPS operates at 450 GeV, the loss in repetition rate be compensated by scheduling $\sim 1.2 \cdot 10^{13}$ protons per pulse to neutrino operation. We have already given good physics reasons against using 450 GeV protons on the neutrino target and would like the Committee to have these clearly in mind when the scheduling of the WBB is discussed.