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A WIDE BAND BEAM ANTINEUTRINO EXPERIMENT IN GARGAMELLE TO STUDY PURELY

LEPTONIC AND OTHER RARE $\bar{\nu}$ INTERACTIONS

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This experiment proposes to principally study rare antineutrino interactions giving rise to an electron in the final state. Of main interest are the reaction

- $\bar{\nu}_{\mu} + e^{-} \rightarrow \bar{\nu}_{\mu} + e^{-}$; leptonic n.c. process
- Dilepton processes
- $\bar{\nu}_{e}$ and ν_{e} interactions
- Events with $\mu e \nu^0$ topology

Gargamelle is assumed to be filled with a mixture of 20 mole % $CF_3 Br$ and 80 mole % $C_3 H_8$, resulting in a liquid with a density of 0.62 gcm^{-3} and a radiation length of 40 cm.

Some expected yields are:

- between 20 and 50 events, depending on the Weinberg angle which is assumed,
- about 100 events with μe final states and an approximately equal number of $\mu\mu$ pairs. The latter will probably be more difficult to extract,
- 1000 events type $\bar{\nu}_{e} N \rightarrow e^{+} N$ and 620 events type $\nu_{e} N \rightarrow e^{-} N$.

Whereas an EMI is not needed for interactions of the type a) such a device is mandatory to realise the full potential of the experiment.

The wide band $\bar{\nu}$ beam N1 is requested with a total intensity on the target of 5.10^{18} protons, which would result in an exposure of 5.10^5 pictures if 10^{13} p/pulse were extracted. It is hoped to complete the exposure within two years, with at least 1/5 of it taken during the first year. A first exposure of about 10^5 pictures would be worthwhile as soon as the intensity has reached a value of 10^{12} p/pulse on the target.

(Summary edited by R. Budde)

References:

SPSC/74-122/P 34; SPSC/75-5/P 39;
SPSC/75-73/P 34 + P 39/Add.1