

SUMMARY OF DISCUSSIONS WHICH TOOK PLACE IN THE SCIENTIFIC COUNCIL  
OF THE GDR NEUTRINO IN MARSEILLE – OCTOBER 15.

F.PIERRE

---

I) THE GSI oscillations.

Mainly presented by J.Kopp

In experiments at GSI, the exponential decays of 2 nuclei (typical lifetimes of a minute) have been observed to be modulated by oscillations of  $\sim 7$ s period.

Statistical significance is 99%. Other nucleus (nuclei?) is being measured.

Some physicists have interpreted these oscillations as manifestations of neutrino mixing, but many theorists believe they certainly cannot be linked to  $\nu$  masses.

II) An explanation of MiniBoone excess?

F.Vannucci has drawn our attention on a recent paper by Hill et al where it is shown that contributions of anomalies could explain the MiniBoone excess at low energy. The final state would be neutrino+gamma, with approximate equal sharing of the energy, at the level of 1/1000 of the cross section. Its identification would require an excellent separation between electron and photon.

=====

III) PROJECT X at FNAL

In the US, the P5 report (spring 2008, 10 years plan) has quoted neutrino physics as one of the Key Scientific Questions: what are the masses and properties of neutrinos and what role did they play in the evolution of the universe? How are they connected to matter-antimatter asymmetry?

FNAL gives priority to neutrino physics, as a part of the Intensity Frontier.

The plan assumes a constant DOE effort at FY2007 level (752 FY07 M\$, intermediate scenario), approval of DUSEL and continued funding of the university program.

The goal is to develop a world-leading program in neutrino science with a multi-megawatt proton source, neutrino beamline to DUSEL, & DUSEL detector.

Fermilab envisions a 2.3 MW proton source (upgradeable) based on an 8 GeV SRF linac injecting into the recycler and/or Main Injector. The construction of the SRF linac is useful for lepton Collider R&D Program(ILC + HE) and is a possible path towards U.S. industrialization of ILC components & technology.

Goal: Construction approval (CD3 ) ~ 2013

In any scenario, upgrade existing FNAL source to 700 KW

In all but lowest scenario, NOvA is constructed

=====

## MICROBOONE

Liquid Argon Time Projection Chamber (LAr TPC) detectors are ideally suited for studying neutrino interactions and probing the parameters that characterize neutrino oscillations. The ability to drift ionization particles over long distances in purified argon and to collect abundant scintillation light allows for excellent particle identification and triggering capability. MicroBooNE is a 175 ton LAr TPC which will be exposed to Fermilab's Booster neutrino beamline starting in 2011. MicroBooNE combines a timely physics program (MiniBoone excess) with the hardware R&D necessary for the evolution of LAr TPCs into massive (~50 kiloTon) detectors necessary to complete our understanding of neutrino interactions.

Actually, it will use both booster (on axis) and MI beam(off axis) neutrino beams. The expected event rate are 100k(booster) and 60k(MI) over 2-3 years.

---