



International Design Study of the Neutrino Factory

IDS-NF Plenary Meeting 1

Date: 16th and 17th January 2008

*The Rutherford Appleton Laboratory,
Chilton, Didcot, Oxon, OX11 0QX*

Second bulletin

1. General information

The first plenary meeting of the International Design Study for the Neutrino Factory (IDS-NF) will be held on the 16th and 17th January 2008 at the Rutherford Appleton Laboratory. The aims of the meeting are:

- To review the baseline for the Neutrino Factory accelerator complex and neutrino detector systems derived through the ISS;
- To agree the baseline specification for accelerator complex and detectors to serve as the starting point of the IDS-NF; and
- To agree the programme of work for the study for the period up to the NuFact08 workshop.

The meeting will be a working meeting, most of the time being devoted to plenary or parallel, working-group, discussion.

2. Topics

The detailed agenda will be developed by the working-group conveners and posted shortly. The issues that will to be addressed at the meeting include:

- Accelerator:
 - Possible modifications to ISS baseline, including:
 - Proton driver capable of 50 Hz, single-bunch operation;
 - Design for a 25 GeV storage ring.
 - Impact of results from target proof-of-principle and particle-production experiments on the ISS/IDS-NF baseline. In particular:
 - The impact of the MERIT results on the specification of the bunch spacing in the proton driver;
 - The impact of the HARP results on the capture system;
 - Plans for completing designs for the baseline systems:
 - Proton driver;
 - Acceleration system:
 - a. Linac, including transport/matching of beam from the cooling channel;
 - b. Full, linear design of the RLAs, including:

- i. Chromatic correction, including sextupoles, etc.;
 - ii. Physical layout: switchyard, dogbone arc crossings.
 - c. FFAG.
 - Design of transport lines, injection/extraction systems, etc.;
 - Tracking through individual systems and end-to-end simulation;
- Engineering for some of the subsystems:
 - Target infrastructure;
 - Baseline capture and cooling systems.
- Detector:
 - Review of baseline detector configuration:
 - Impact of the detector at the magic baseline;
 - Implementation of a full simulation of the baseline (MIND) detector in the oscillation analysis;
 - Consideration of the effect of the difference in neutrino beam properties between the near and far detectors.
 - Evaluation the systematic uncertainties for MIND. Present assumptions are: uncertainty on the signal detection efficiency 2.5%, independent of energy; and uncertainty on background contribution 20%, independent of energy;
 - Evaluation of the baseline specification for the silver- and platinum-channel detectors;
 - Impact of the individual systematic errors on the physics reach and measurement precision.
 - Consideration of options beyond the present baseline, for example the low-energy Neutrino Factory;
 - Systematic errors related to cross-section measurements and determination of electron (anti)neutrino cross-sections for CP-violation and matter-effect measurements;
 - Extrapolation of cross section measurements to energies of interest at the Neutrino Factory;
 - Impact of the measurements that will be made by Minerva, SciBooNE etc.;
 - Implementation of full covariance matrix for atmospheric and solar parameters.
- Physics and performance evaluation:
 - Provide sensitivity estimates and evaluate measurement precision of various options as requested;
 - Track new developments (beyond the current baseline) such as the low energy Neutrino Factory;
 - Understand the optimisation of the facility in the context of non-standard physics;
 - Establish a physics case for precision measurements of neutrino oscillations for all values of θ_{13} ;
 - Keep track of competitors to the Neutrino Factory
 - Study the near detector, both at a super-beam and the Neutrino Factory

- Review the status of cross-section calculations and parameterisations of the data;
- Review the status and impact of muon physics at the Neutrino Factory.

3. Registration

Please register via the IDS-NF WWW page at:

<http://www.hep.ph.ic.ac.uk/ids/communication/RAL-2008-01-16/index.html>

4. Accommodation

A block of rooms has been booked at Ridgeway House (<http://www.scitech.ac.uk/About/Find/Ridge/Introduction.aspx>). The rooms will be allocated on a first-come first served basis. To make a booking please email ridgewayhouse@rl.ac.uk (or, alternatively accommodation@rl.ac.uk). Please ask for one of the rooms booked for the IDS-NF workshop.

5. Correspondence

All correspondence concerning the workshop should be addressed to:

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