Status and prospects WP6

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Tasks of WP6

- Coordination task: coordination of the work of the different participants.
- Evaluation of physics performance task: the physics potential of different facilities will be evaluated in a coordinated manner.
- Optimization task: the distance to the detector and the neutrino energy need to be optimized for all facilities taking into account the constraints from the accelerator WP. Similarly the synergies of the combination of two or more experimental setups at the same facility need to be quantified.
- Evaluation of systematic uncertainties task: a fair comparison of physics potential requires including all systematic uncertainties, some related to the experimental setup (to be quantified by WP 5) and some related to theoretical unknowns. WP6 will include these uncertainties in the physics analysis in a unified fashion.
- Comparison task: the different facilities will eventually be compared in terms of their physics performance.

Results and activities of WP6

- Coordination

  -parallel joint meeting with IDS-NF March 2009
  -we held a very successfull theory workshop in Cosener's House, Abingdon (UK) in 8-10 June 2009

Results and activities of WP6

- Evaluation of physics performance

New tools: new package MonteCUBES with Markov chain Montecarlo to perform fits with many parameters

Blennow, Fernández-Martinez,arXiv:0903.3985 [hep-ph], EURONU-WP6-09-03

Potential for physics beyond the 3ν standard scenario

1) Performance of Nufact at probing non-unitarity and related CP violation

Antush et al,arXiv:0903.3986 [hep-ph], EURONU-WP6-09-04

2) Performance of Nufact at probing 3+1 neutrino models

A.~Donini,et al ,arXiv:0812.3703 [hep-ph], EURONU-WP6-08-01

3) Performance of Nufact at probing NSI

J. Tang and W. Winter,et al ,arXiv:0903.3039 [hep-ph], EURONU-WP6-09-02

4) Non-standard neutrino interactions in the Zee-Babu model,
T. Ohlsson, T. Schwetz and H. Zhang,arXiv:0909.0455 [hep-ph], EURONU-WP6-09-08

5) Short-Baseline Electron Neutrino Disappearance at a Nufact
C. Giunti et al ,arXiv:0907.5487 [hep-ph], EURONU-WP6-09-07

Potential for direct detection of neutrino mass

Measuring the neutrino mass with radioactive ions in a storage ring
M. Lindroos ,et al ,arXiv:0904.1089 [hep-ph], EURONU-WP6-09-05

Comparison

First hints for CP violation in neutrino oscillations from upcoming Superbeam and reactor experiments
P.~Huber,et al ,arXiv:0907.1896 [hep-ph], EURONU-WP6-09-06

•Optimization

-Li betabeam in CERN baseline betabeam scenario

E. Fernández-Martinez in preparation (in coordination with WP4)

-Optimized two baseline bb experiment

Choubey, S. et al ,arXiv:0907.2379 [hep-ph], EURONU-WP6-09-09

Deliverables and Milestones First year

Milestones:

Update physics potential 12 months Report

Deliverables:

Review physics of baseline scenarios and optimization 12 months Report

Deliverable 4

Report in preparation:

1) Introduction
2) Update physics goals: NSI, sterile neutrinos
3) New tools: Markov chain MC for fits
4) Nufact optimization
   - LE NF
   - NSI and sterile nus: importance of near detectors
   - Near detector and systematic errors
5) Betabeam optimization
   - Baseline scenario with new ions -> new baseline
   - Revision of atmos neutrino background
   - Two baseline optimizations for the greenfield study
   - New idea to measure the nu mass
6) Summary: ISS exclusion plots with new optimizations

IAP recommendations for WP6

1) More interaction with other WPs

Idea: have a bilateral or trilateral regular & informal meeting (could be by phone also) WPn-WP5-WP6 n=1,2,3,4 to review progress and/or exchange info

We could design a contact person for each exchange WPx-WPy, so the meeting could involve only a few people

2) Develop a comparative metric of physics performance
I am not sure I understand this…
We could have a WP1-WP6 meeting ?