

Neutrino Subgroup Nu1

“Neutrino Oscillations in the 3-Flavor Paradigm”

Conveners:

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SLAC, March 7, 2013

Subgroup Nu1 at SLAC

Thank you for all the community input!

- **Whitepapers**
 - 28 whitepapers submitted to Nu1
 - Many ideas and novel approaches to (enhancing) mass hierarchy and CP violation measurements
- **Topics/Sessions**
 - Precision measurements of oscillation parameters: Status quo and future prospects
 - Mass hierarchy determination
 - CP violation and massive detectors
 - Decay-In-flight experiments and cross-section issues
 - New experiments and facilities
- **Summary Talks/Discussion**
 - 20 summary talks
 - lots of discussion
 - some homework for experimental groups
- **Next Step: Subgroup Report**
 - report will address how to connect present and future

Connecting the Status Quo with the Future

Kathy Turner, DOE

- **Have near term program plan; need program plan for the future**

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HEP Program - Intensity Frontier Issues

Issues we grapple with when laying out and defending the Intensity Frontier program →

- **We must have long-term goals for the precision with which we need to measure the neutrino mixing matrix elements.**
 - This is an essential element that will guide the development of the neutrino program.
- **This question is very important since it enables us to explain to all our stakeholders why we need a wide variety of neutrino experiments.**
 - **It also guides our investment strategy on R&D** to support neutrino factories since small errors may require higher beam intensities than can be reached with conventional targets/beamlines.
- **Many other important areas of investigation were well summarized in last year's intensity frontier workshop. We need to turn that into a situation analysis for each of the main areas.**
 - What are the technology capability gaps ?
 - Are there projects or pilots needed to fill out the program?

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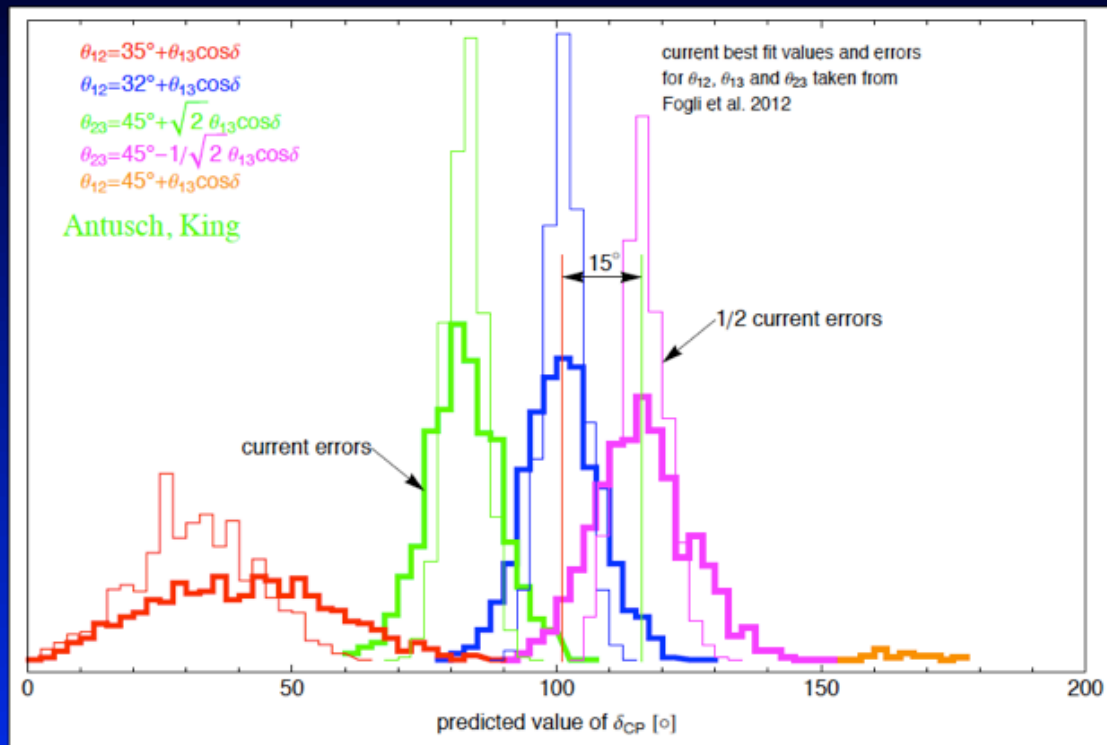
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Establishing Long-Term Precision Goals

Sum rules



3σ resolution of 15° distance requires 5° error. NB – smaller error on θ_{12} requires dedicated experiment like Daya Bay II

P. Huber – VT-CNP – p. 11

P. Huber

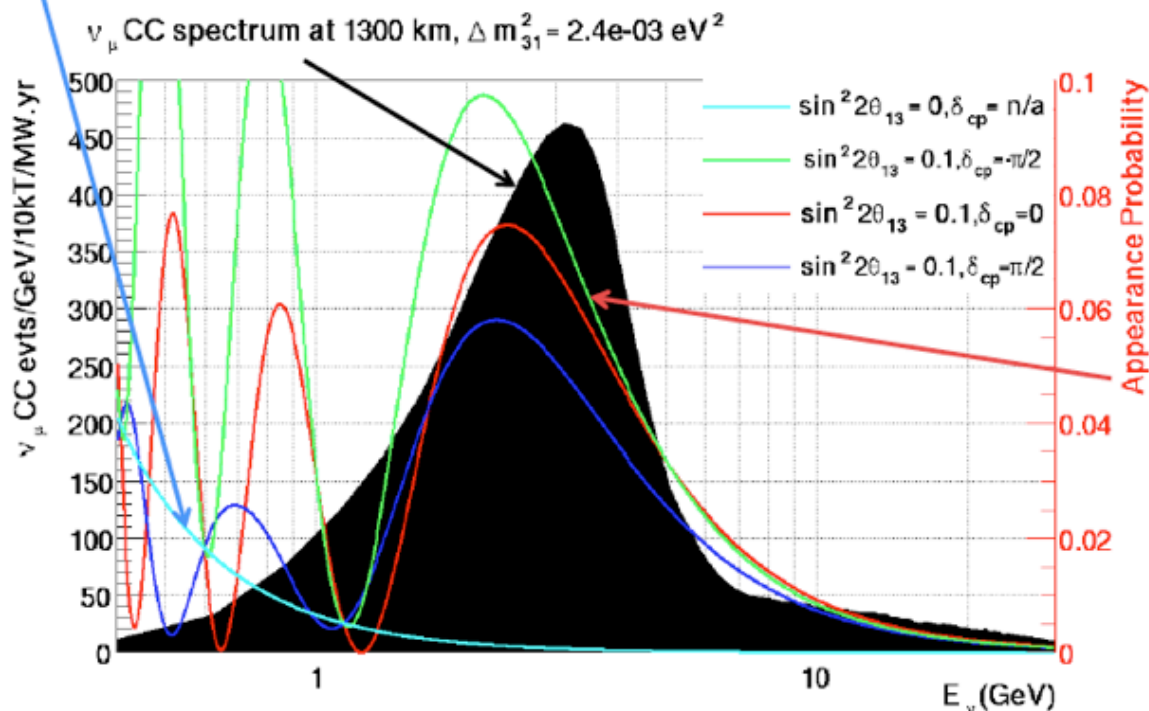
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Homework Example

LBNE SPECTRUM

M.Bishai

Homework problem! How does the solar term affect searches at the second minimum?



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H. Robertson

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HEP Program – Implementation Strategies

At the Intensity Frontier:

- US is a (the?) world leader and needs new facilities and/or upgrades of existing facilities to maintain its position
 - Has the potential to attract partners if we can get the program going
 - Portfolio of experiments and science case is diverse; makes explaining it to stakeholders difficult
 - The scale of the projected investments is a big challenge

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what can new proposals bring to the US portfolio?

Next Step: Nu1 Subgroup Report

- Conveners will draft report outline following this workshop.
- Will ask (“twist arm”) summary speakers, experts, and others for written contributions. Please volunteer if you are interested in contributing.
- We welcome additional input on the metrics we posted for discussion of new experiments and proposals.
- Homework from the SLAC discussions is to be completed by the time of the ANL workshop, April 25-27, 2013.
- There will be opportunities for community comments and input on the subgroup report through April-June.

