

MaCh3 status and plans

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for the MaCh3 group

Overview

- ▶ Leila updated on Run 1-7 5 sample status
- ▶ Preparation for main summer analysis
- ▶ New things we're working on

Preparations for the summer: Analysers and baseline

- ▶ Planned baseline analysis is 5 sample+ND280 joint fit with new Xsec parameterisation
- ▶ Leïla, Clarence and Patrick (me) will be the main analysers for this
 - Leïla has to graduate at some point this summer
 - We also have Elder and Kirsty in the group able to help

Preparations for the summer: Framework

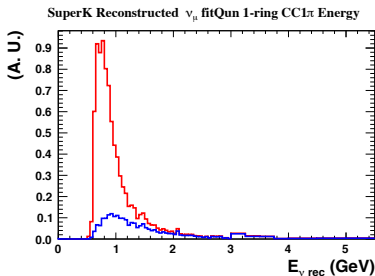
- ▶ Turnaround from final inputs to results is about 1 week each for Asimov fits and data fits
- ▶ Clarence has made some improvements to code:
 - Multi-threaded to improve speed
 - Now easier to add new parameterisations to ND280

Preparations for the summer: New Xsec parametrisation

- ▶ Parameters are implemented in our ND280 (Clarence) and SK (Kirsty) code to the extent they're final
 - BeRPA implemented event-by-event already
- ▶ I'm waiting for freeze of parameters for spline production and SK implementation of spline parameters (see other talk)

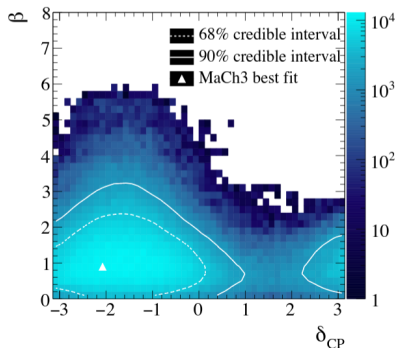
fitQun CC1 π : Elder

- ▶ Working on adding fitQun numu pion ring samples
- ▶ Aiming for stats only analysis in the next few weeks
- ▶ Will then add FSI+SI covariance matrix (with current implementation) as a conservative approach
- ▶ Also, working on preparing splines for this sample
- ▶ Red: unoscillated, Blue: oscillated



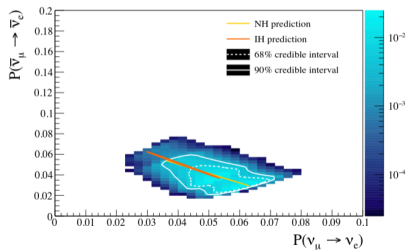
Continuous β : Kirsty

- ▶ Take β from $\bar{\nu}_e$ appearance analysis and allow to be continuous
- ▶ Have run Asimov's (shown today set 1 wRC)

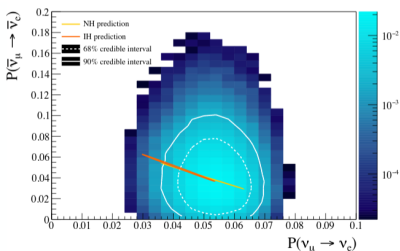


Continuous β : Kirsty

- ▶ Take β from $\bar{\nu}_e$ appearance analysis and allow to be continuous
- ▶ Have run Asimov's (shown today set 1 wRC)
- ▶ nb lower rightmost point is $\delta_{CP} = -\pi/2$



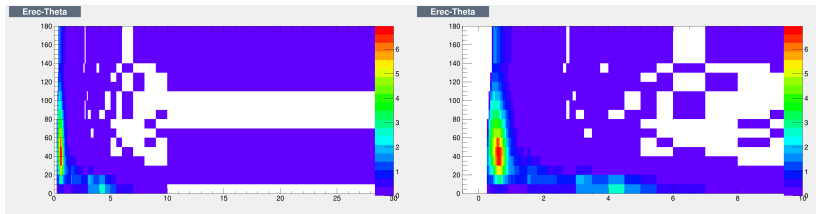
fixed $\beta = 1$



Continuous β

2D ν_μ studies: Me

- ▶ Looking at finding a working $E_{rec} - \theta$ binning for 2D ν_μ
- ▶ Difficult to capture oscillation dip without very large number of bins
- ▶ Very preliminary kinematic plots shown here



ND280: Clarence

- ▶ For summer: ready subject to last minute changes in Xsec parameterisation
- ▶ For future hopefully moving to psyche 3 at end of summer
 - Will allow ν_e and 4π samples to be added
 - Dedicated person for this effort in BANFF now (Pierre Lasorak)

Sterile search: Tarak

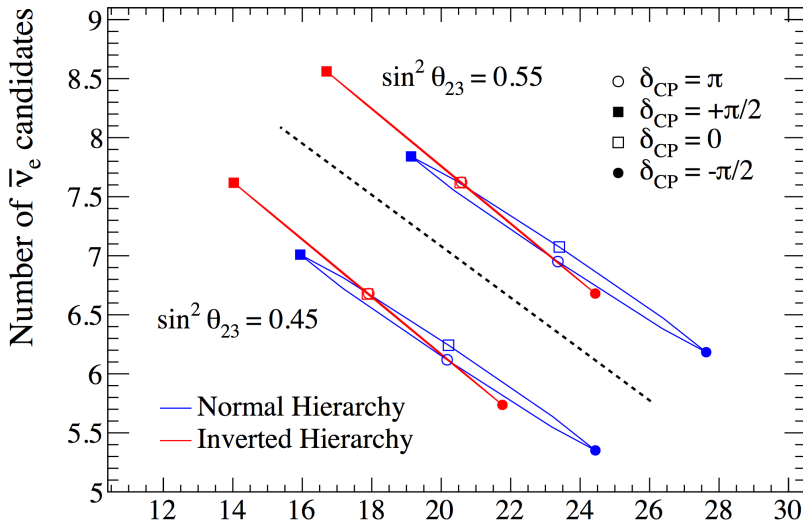
- ▶ Plan to implement ND280 ν_μ disappearance analysis with P6 and compare to previous analysis (based on P5)
- ▶ Have implemented 2 flavour oscillation weights
- ▶ Working to incorporate this into the Markov Chain
 - Was planning to use BANFF-like approach for cross-section parameters
- ▶ Significant effort recommended by NIWG convenors to implement a satisfactory cross-section model [see here](#)
- ▶ Plan to have preliminary sensitivity studies with the recommended cross section model by Summer

Conclusions

- ▶ On track for Summer analysis
 - Ready for new Xsec parameterisation when it arrives
 - Framework is stable
- ▶ Several interesting new studies in progress
 - New samples at SK and ND280, continuous beta etc.

Backup

Continuous beta



Continuous beta

