

New/updated plots

Jeremy Fleishhacker

Chris Marshall

University of Rochester

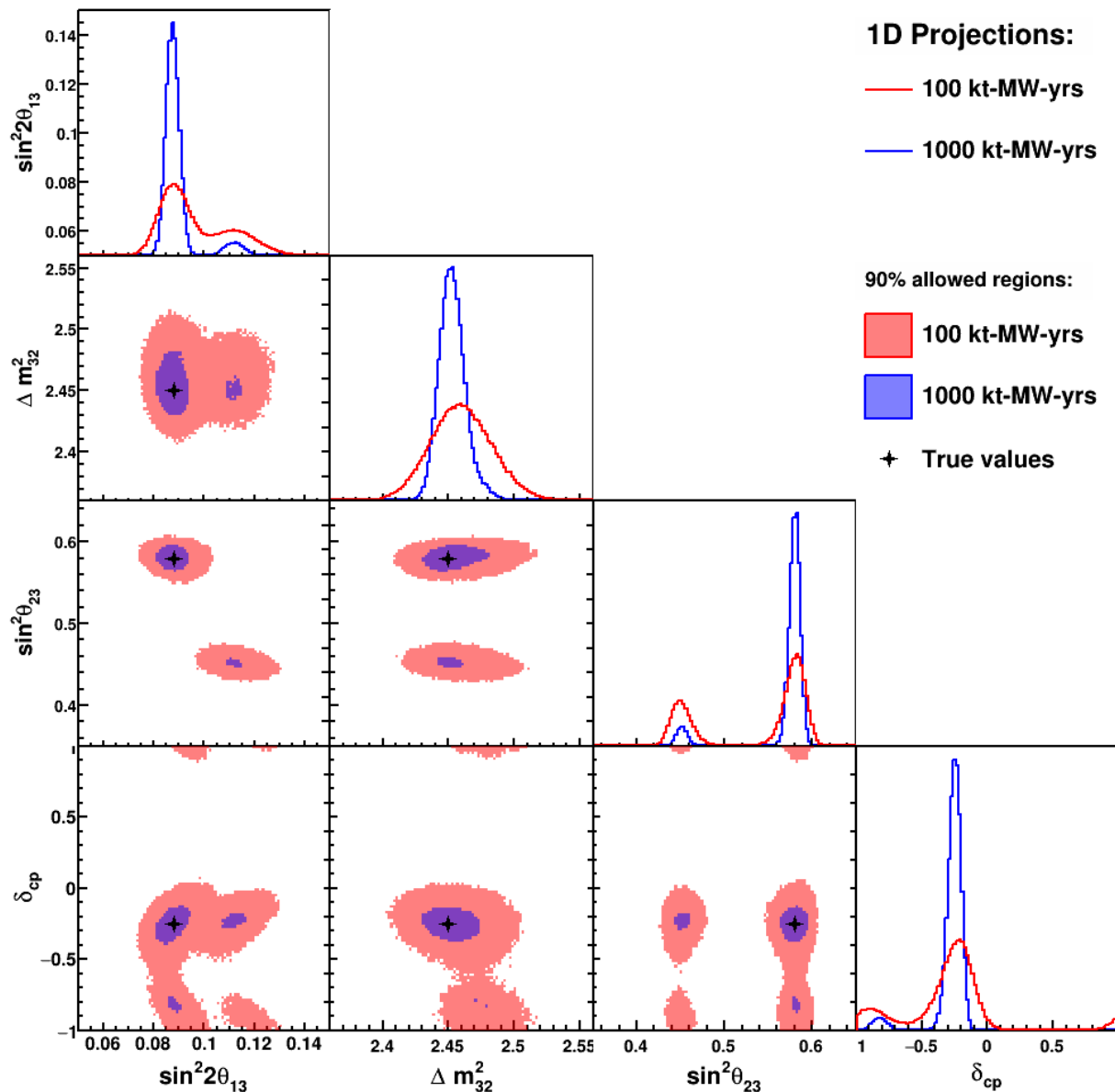
3 April, 2023



Context

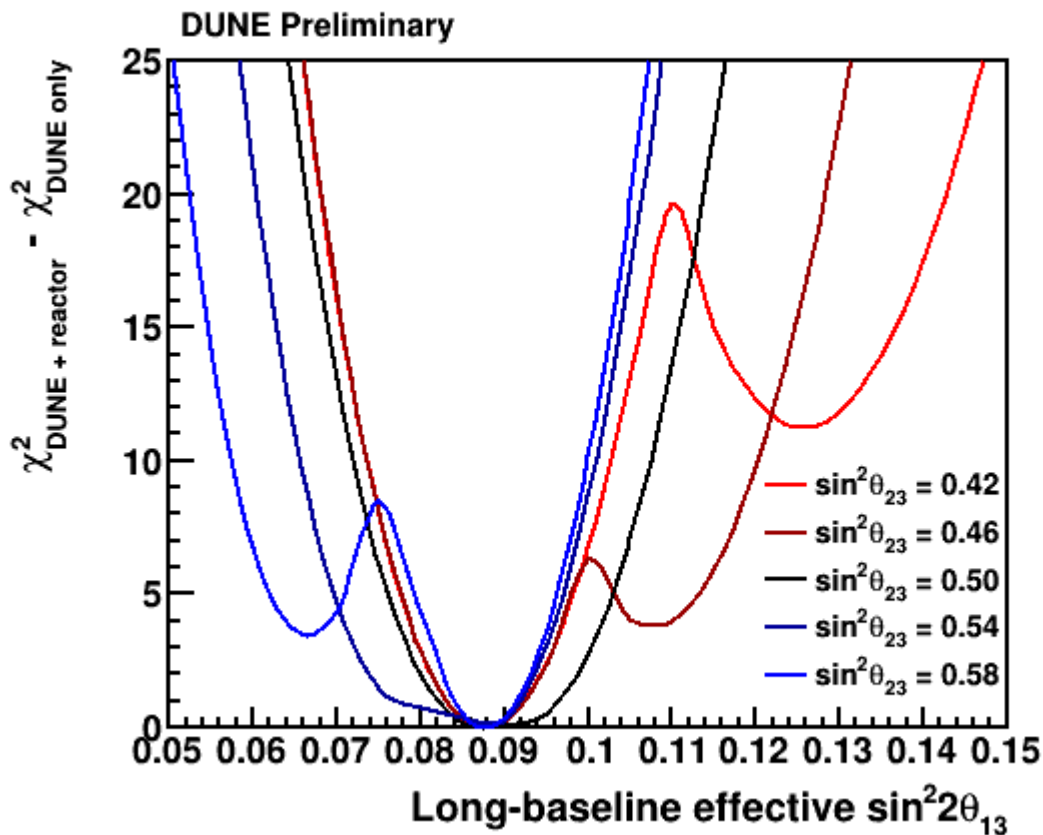
- “Precision measurements” study was presented many times last summer
- Uses TDR analysis, but focusing on resolving degeneracies in parameter measurements
- Paper (DocDB-26640) went through LBL WG review
 - There is one lingering issue that is being worked on
 - A Feldman-Cousins analysis of the “theta13 tension” has revealed some strange pathologies due to fits getting stuck in local minima that has taken a long time to sort out
- Jeremy Fleishhacker did most of this work and is giving a contributed talk at APS in 2 weeks
- We would like to approve some of the plots in the paper for his talk

4D allowed regions



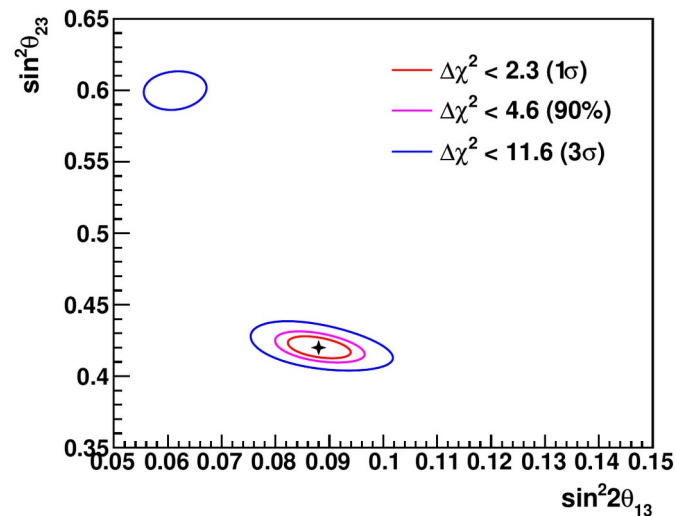
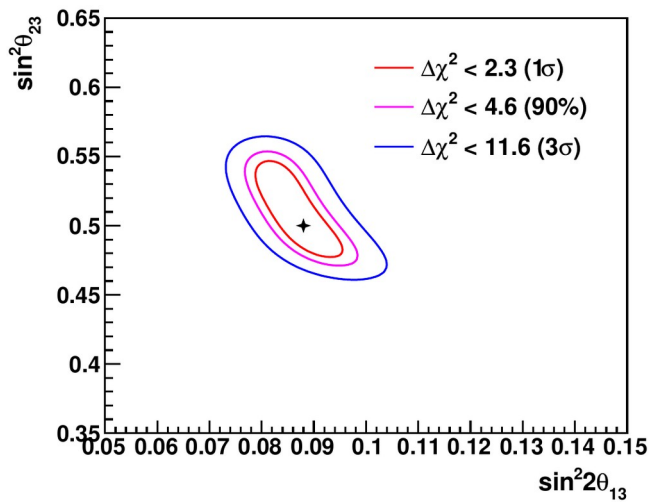
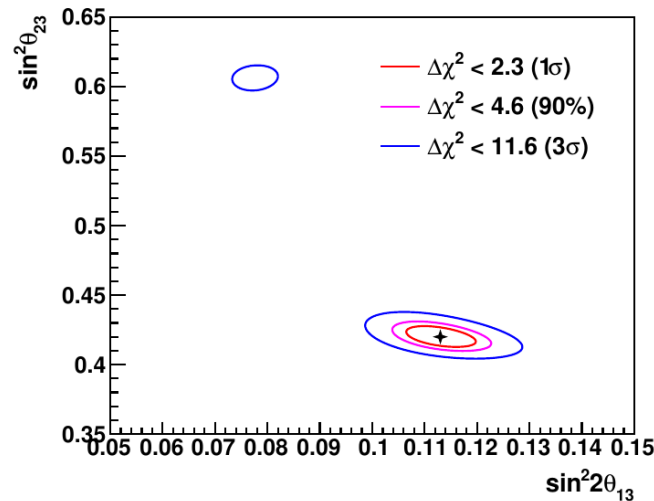
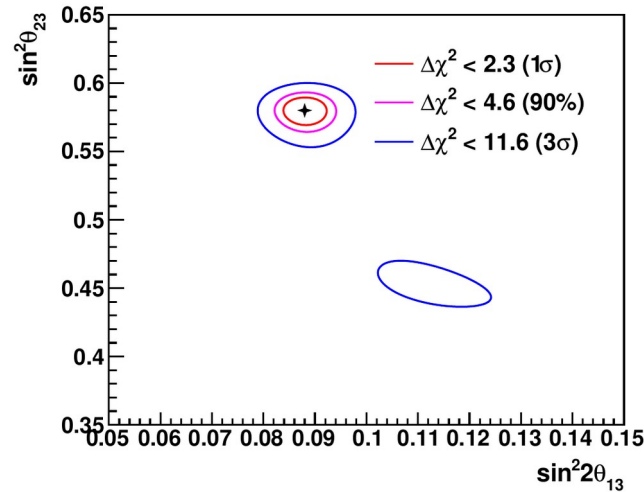
- Previously we showed the 2D projections of the best fit points
- This is showing only the 90% allowed region(s) based on this, and comparing the 100 vs 1000 kt-MW-yrs
- True point is

Hypothetical tension with reactor theta13 measurement



- Suppose θ_{13} as measured by LBL experiments differs from 0.088, i.e. due to non-unitarity, or some NSI matter effect
- What is the significance for DUNE to be sensitive to this
- Cannot use the reactor constraint to establish θ_{23} octant, so for non-maximal values there are dips where the wrong-octant solution becomes preferred

2D Asimov scans with different true points



- Shows how θ_{13} resolution depends on true θ_{23} , and how wrong-octant regions are correlated with θ_{13} allowed regions
- With 1000 kt-MW-yr, we can resolve this at 90% but not at 3σ for some true points