

Advanced ORCA sensitivity calculation – a small start

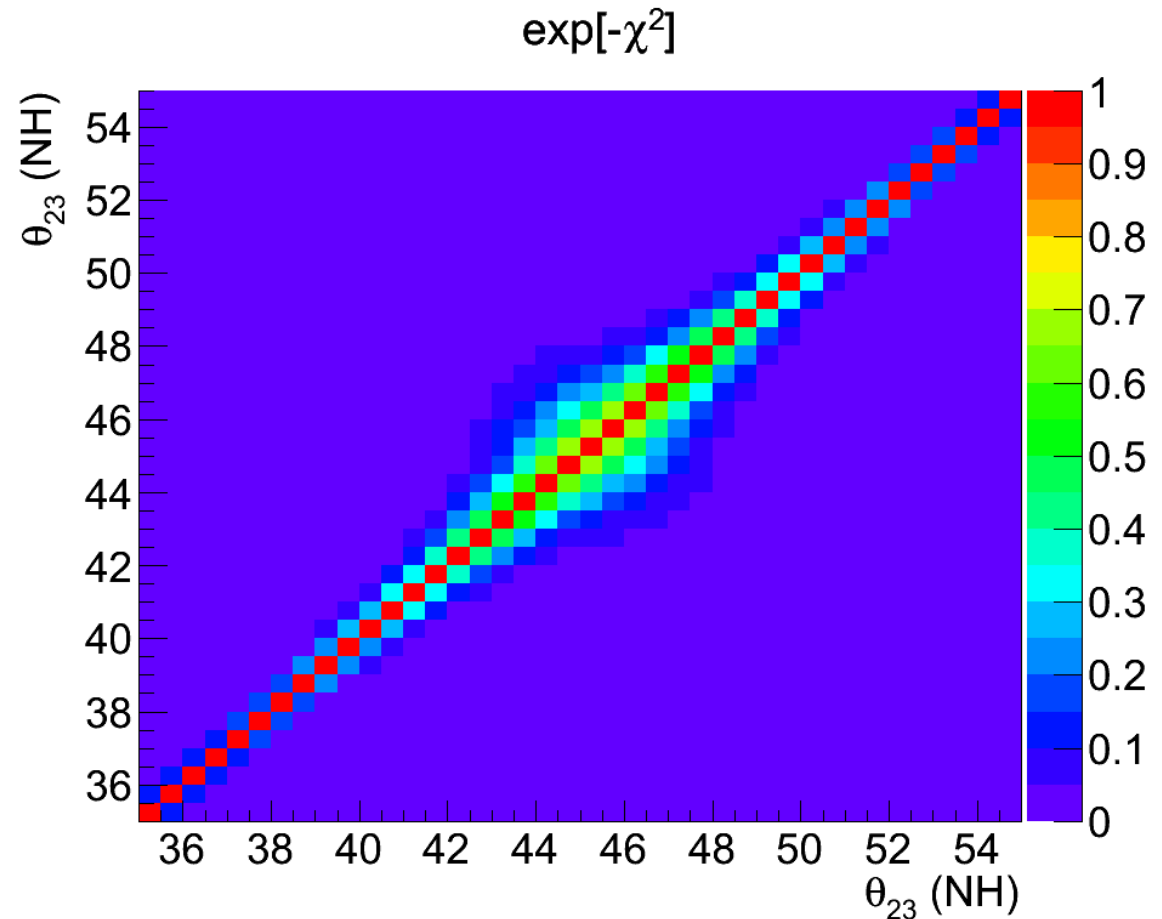
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The problem

- We want to measure the hierarchy
- But also θ_{23}
- The two are correlated in a **complicated** way

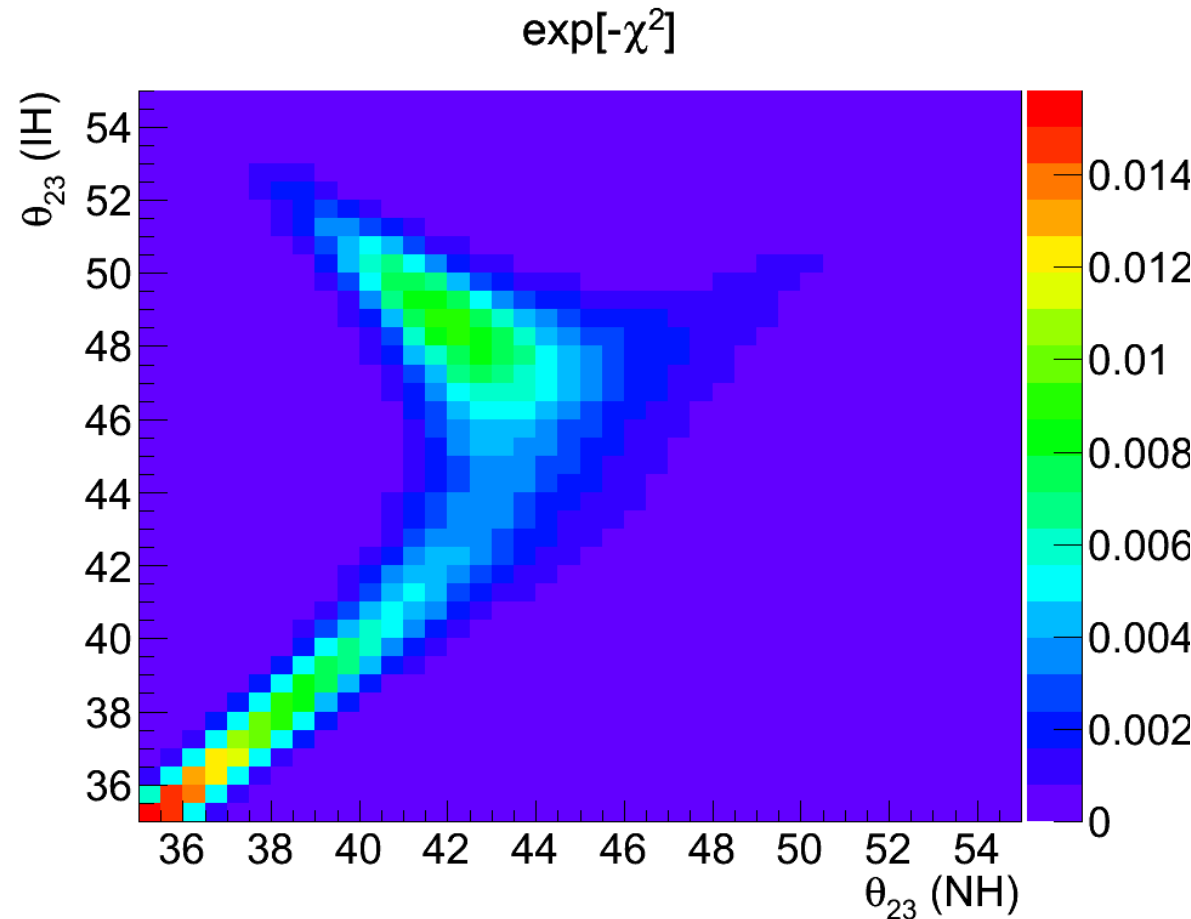
The problem

- NH vs NH
- Looks as expected



The problem

- NH vs **IH**
- Looks strange
- Solutions are no longer on diagonal
- Multiple maxima for theta23
- Partial **degeneracy** between hierarchy and theta23 octant



Normal approach (LoI)

- Only care about the hierarchy
- Draw pseudo-experiments, for each
 - minimize the likelihood (once for NH, once for IH)
 - find best fit values
 - calculate likelihood ratio
- Study distribution of best fit values

New approach

- Take into account complex correlation between hierarchy and θ_{23}
- Study likelihood (Bayesian)
- Answer questions like:
 - which range of hierarchy + θ_{23} can be excluded at 90% confidence level for a given pseudo-experiment?
- Much more like the actual experiment will work

Toy model

