

# $\mu$ BooNE Sensitivity Studies

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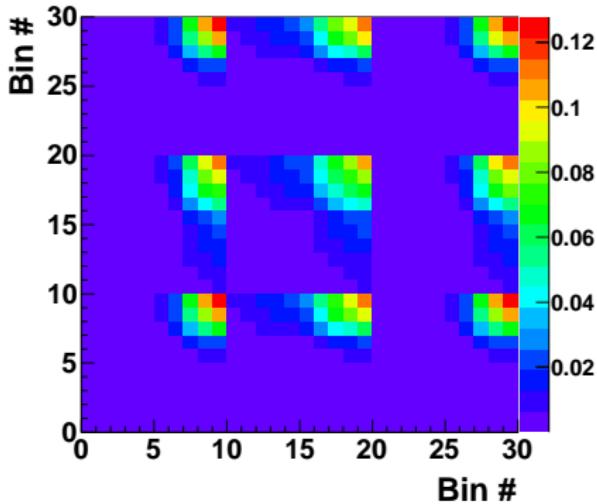
June 14th, 2013

# Systematics considered

- ▶ stastics only
- ▶ xsec
- ▶ pipflux
- ▶ nueccnumuccmid
- ▶ nueccncmid
- ▶ nuecceff
- ▶ kpfluxnu
- ▶ k0flux
- ▶ all efficiency systematics
- ▶ all flux systematics
- ▶ all systematics

# What do the systematics look like?

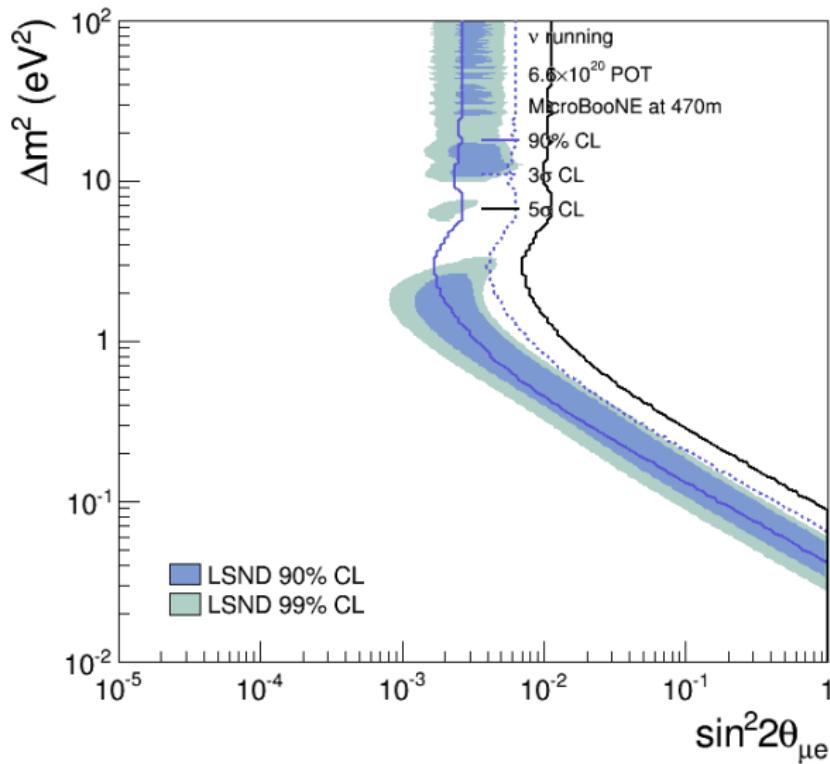
Fractional Covariance Matrix: kpfluxnu



$$\chi^2 = \sum_i^N \sum_j^N (T_i - O_i) M_{ij}^{-1} (T_j - O_j) \quad (1)$$

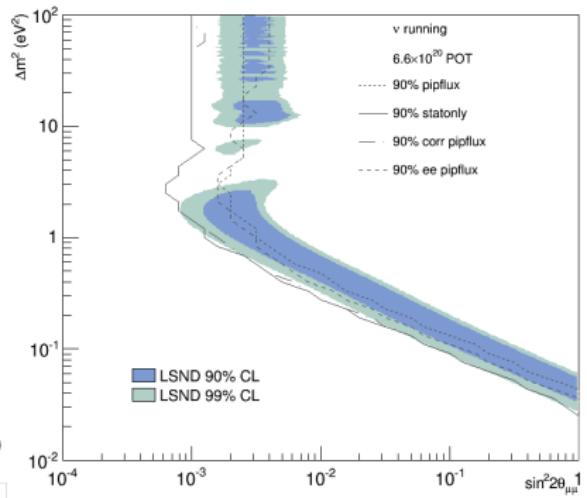
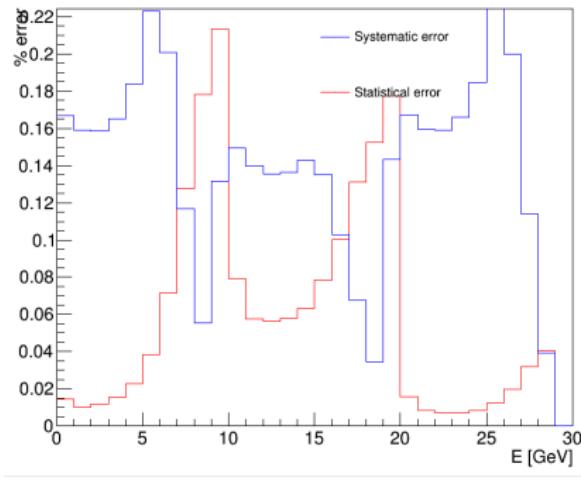
# Sensitivity of experiment

For example, using the systematics for xsec:



# Comparing uncertainties with $\chi^2$ sensitivity

Statistical error vs. systematic errors: pipflux



## Coming up next...

- ▶ Currently sensitivity graphs are based on a 50x50 grid. I generated a 500x500 one but am having some ROOT difficulties using this finer grid!
- ▶ Get code from Corey Adams that generates the ntuples of simulated  $\nu$  events and work out the reconstructed energy of events so that we can bin  $\nu$ s by this energy instead of the MCTruth energy.