CCπ^0 update

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Unfolding bias and systematic error

- The bias can be estimated as: **b = (UBU - U) d**, where **U** is the unfolding matrix, **B** is the bin migration matrix, and **d** is the data vector. This is from Cowan and Colin (I think Mike did this as well). Assuming this is a one sigma excursion we can prescribe a covariance matrix for the bias as: $\mathbf{V}_{ij}$ = $[\mathbf{(UBU - U)\ d}]_i[\ \mathbf{(UBU - U)\ d}]_j$.

- **If we vary the xsec systematics as a way to evaluate the unfolding uncertainty does adding a term to account for the bias double count the errors?**

Assessing OM and Unfolding errors

- I don't think so. In fact, we need to address changes to the true distribution, and OM to assess the unfolding errors.

- Remember: bias = **U(BU - I)d**. If our unfolding matrix was the inverse method, then we'd have *no bias!*

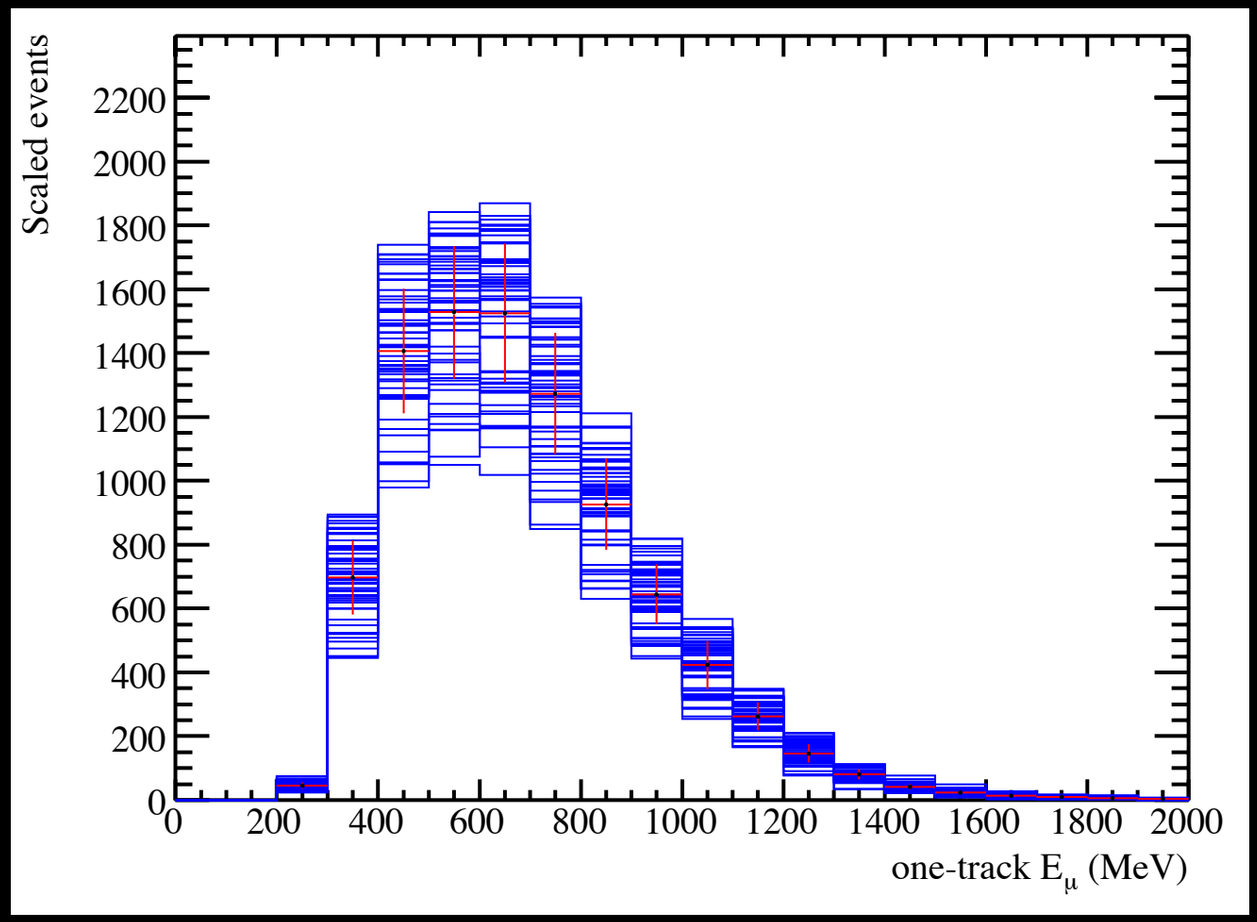
- That is, no bias from the underlying distribution. That does not mean that the detector response is error free.

OM errors with low statistics

- While varying the OM unfolding matrix is possible for 1-D distributions, I do not believe that it can be done for 2-D.
  - Imagine a 2-D distribution that has 20 bins in each dimension. That means that the unfolding matrix has 20x20x20x20 = 160,000 elements!
- What I propose is to calculate the OM errors by using the OM as fake data.
- This way, my method of addressing the OM errors will be consistent for all measurements we choose to make.

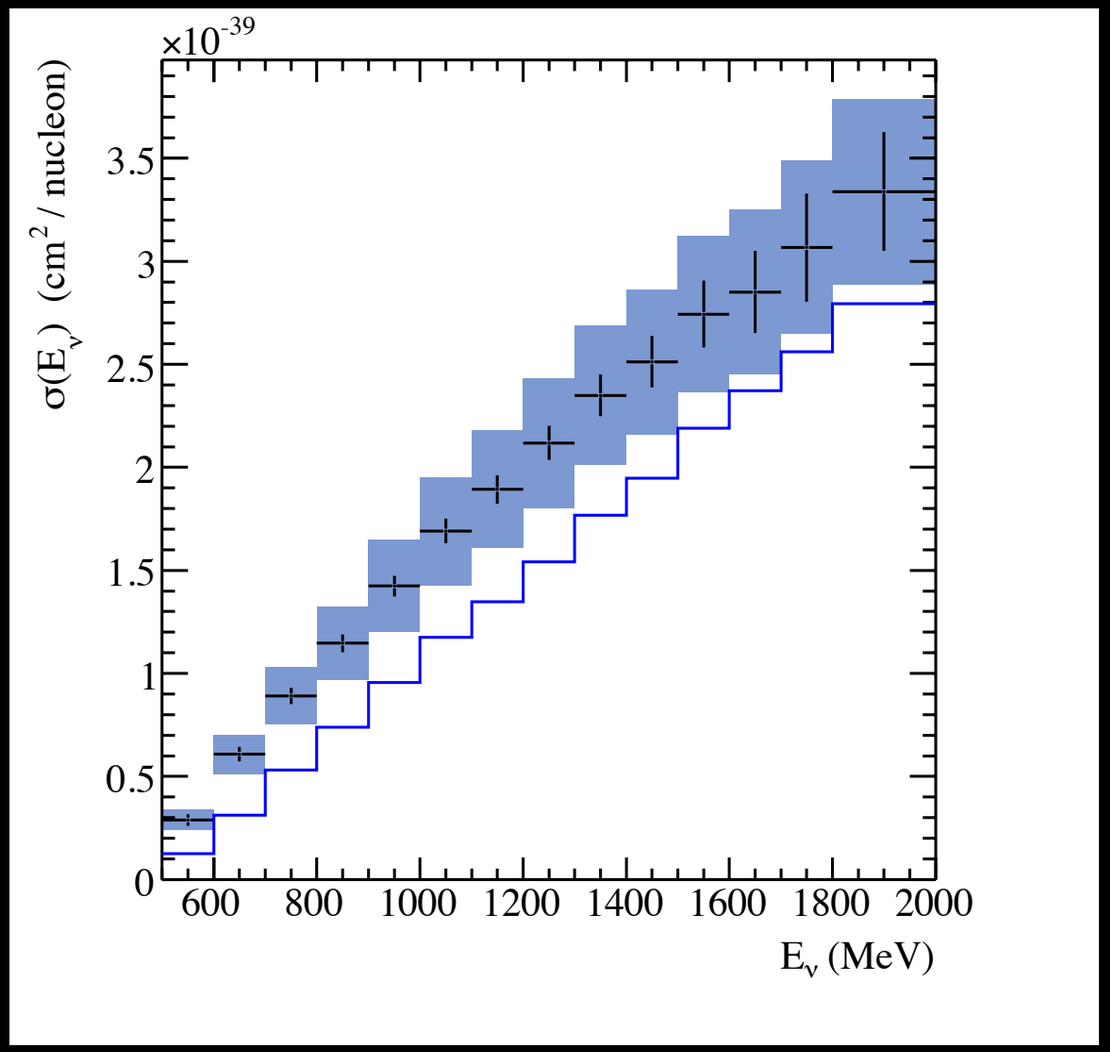
One-track OM

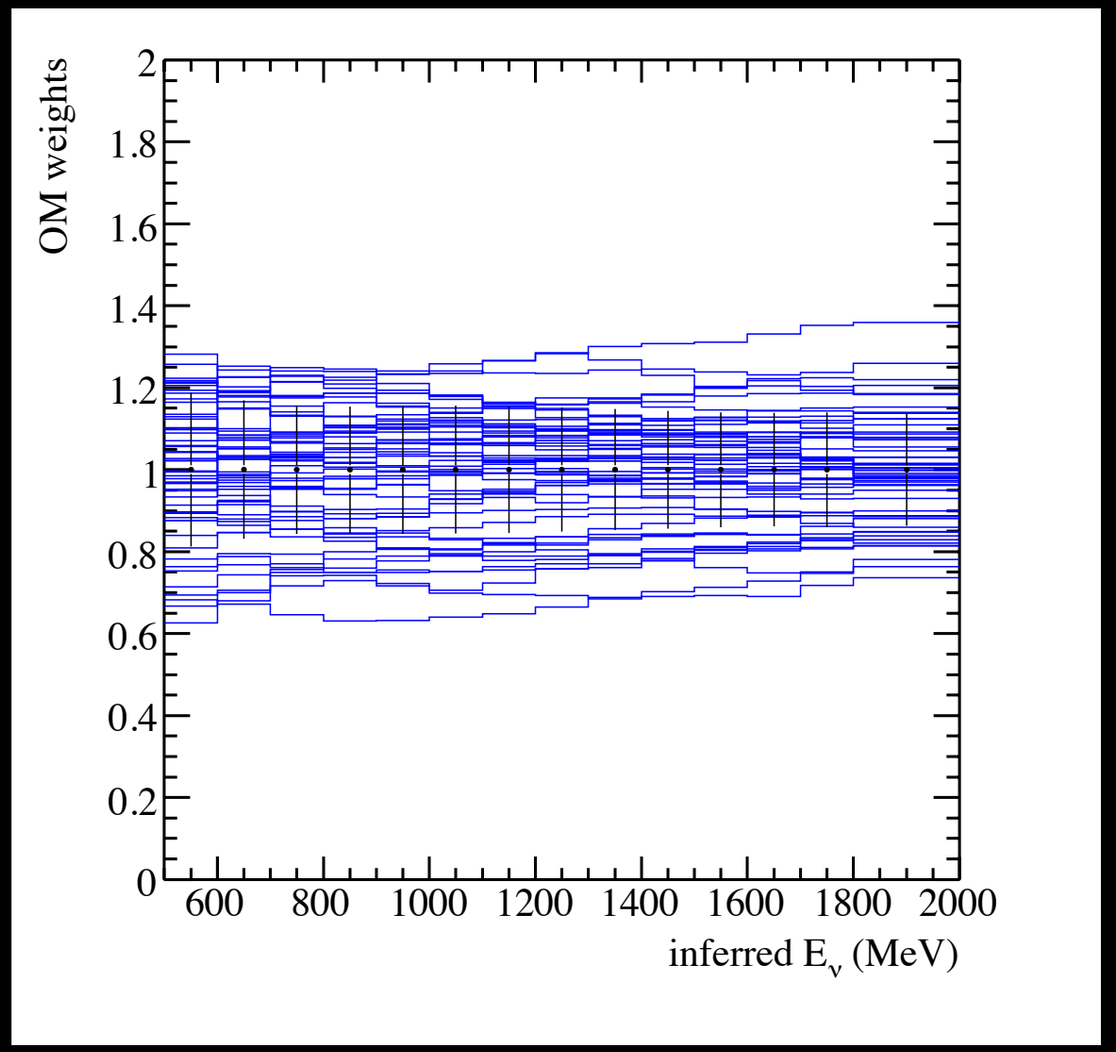
- The OM for 54 msims, about 20% missing. Means that this is an upper limit on the OM error.
- The OM has large variations for signal events in even one track variables.



OM errors

- OM and propagated statistical errors on the cross-section.
- OM weights with the diagonal error for 54 OMs (missing a bit due to corrupt files).
- The OM error is large, which I feel is exaggerated by the statistical error.





Other stuff

- All errors but disc and qtcor are ready to go.
- I need to rerun some parts of the OM multisims (week or so of running).
- OM might be our largest source, though I expect it to reduce somewhat with the additional statistics.
- I will also try to evaluate the OM errors as MC, if it reduces the error significantly, then I don't think we can do 2-D xsecs. Otherwise, we know this method works.