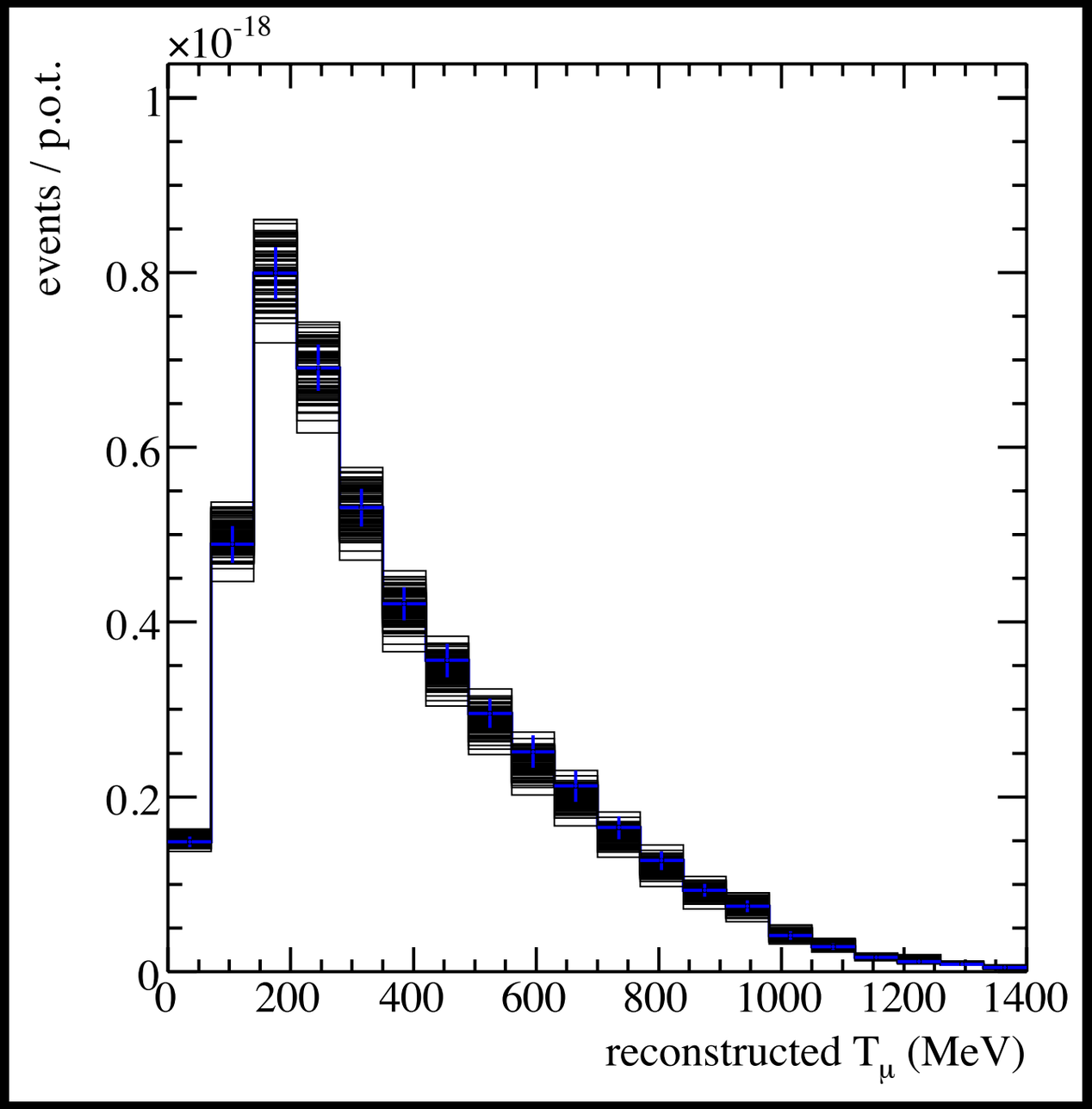
$CC\pi^0$ update

Robert Nelson
2009.10.6

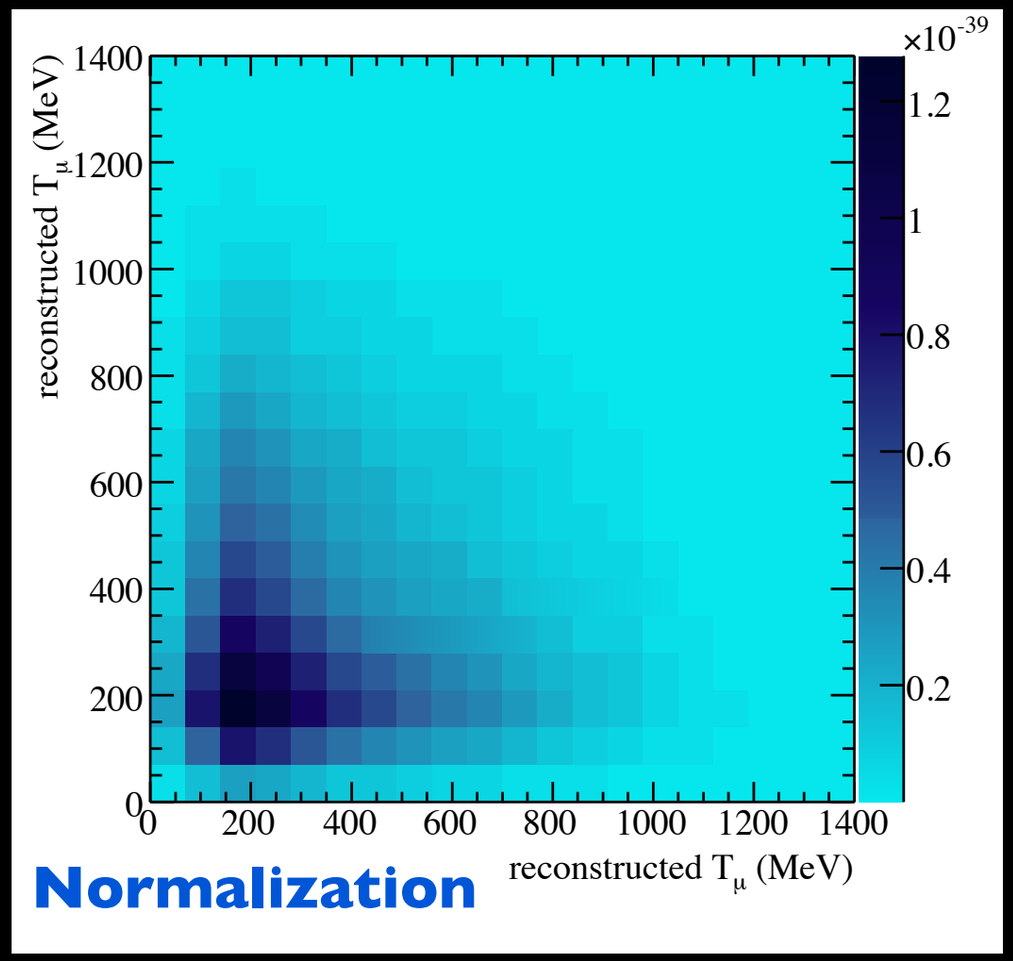
Beam π^+ errors

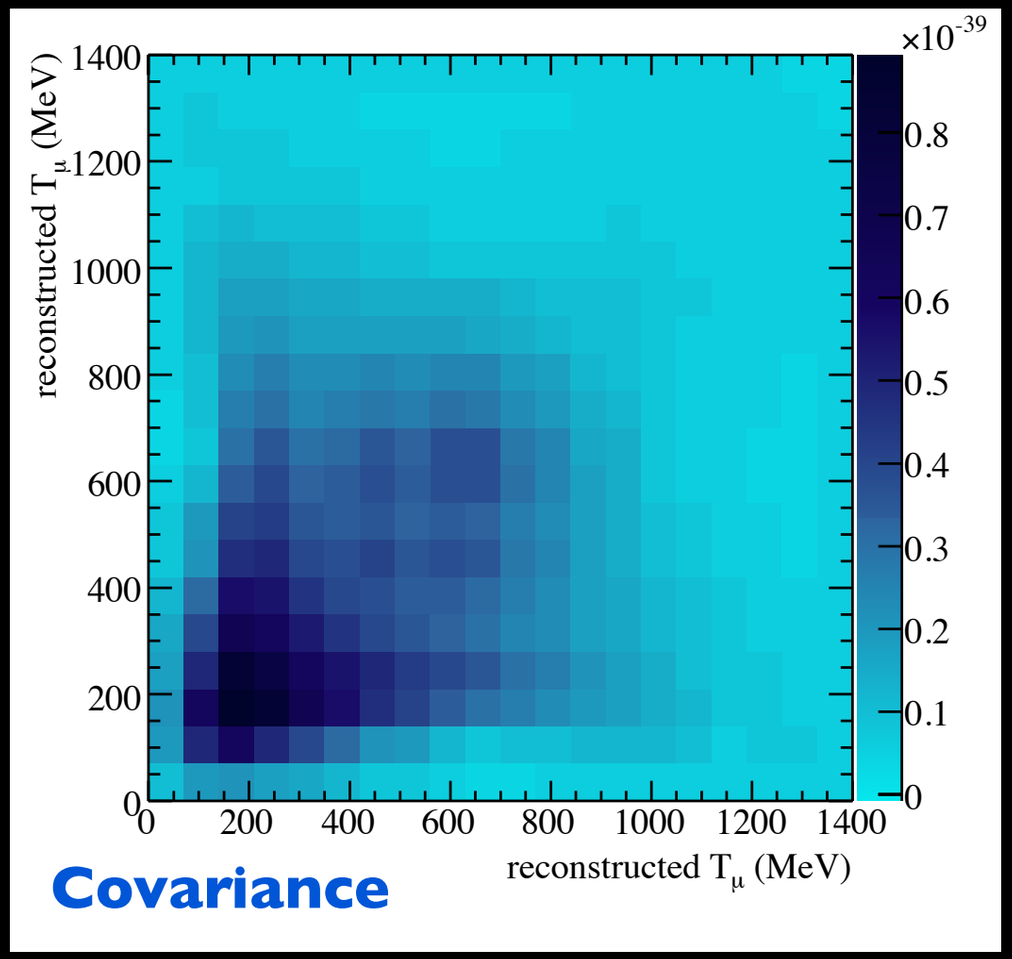
- Plotted are 100 re-weighted beam π^+ multisims along with the CV with diagonal errors.

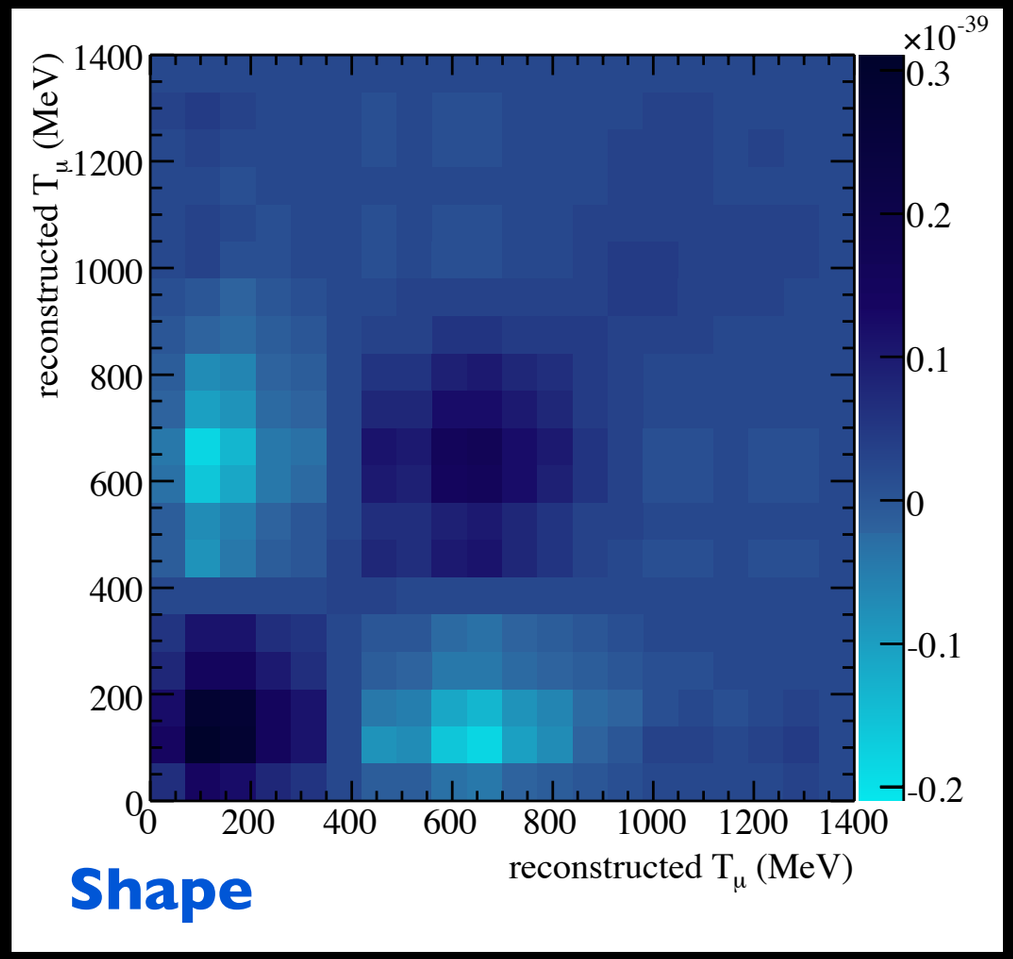


Beam π^+ errors

- The covariance matrix has been separated into its shape and normalization components according to the prescription in technote #253 (M. Shaevitz). I've ignored the "mixed" errors.

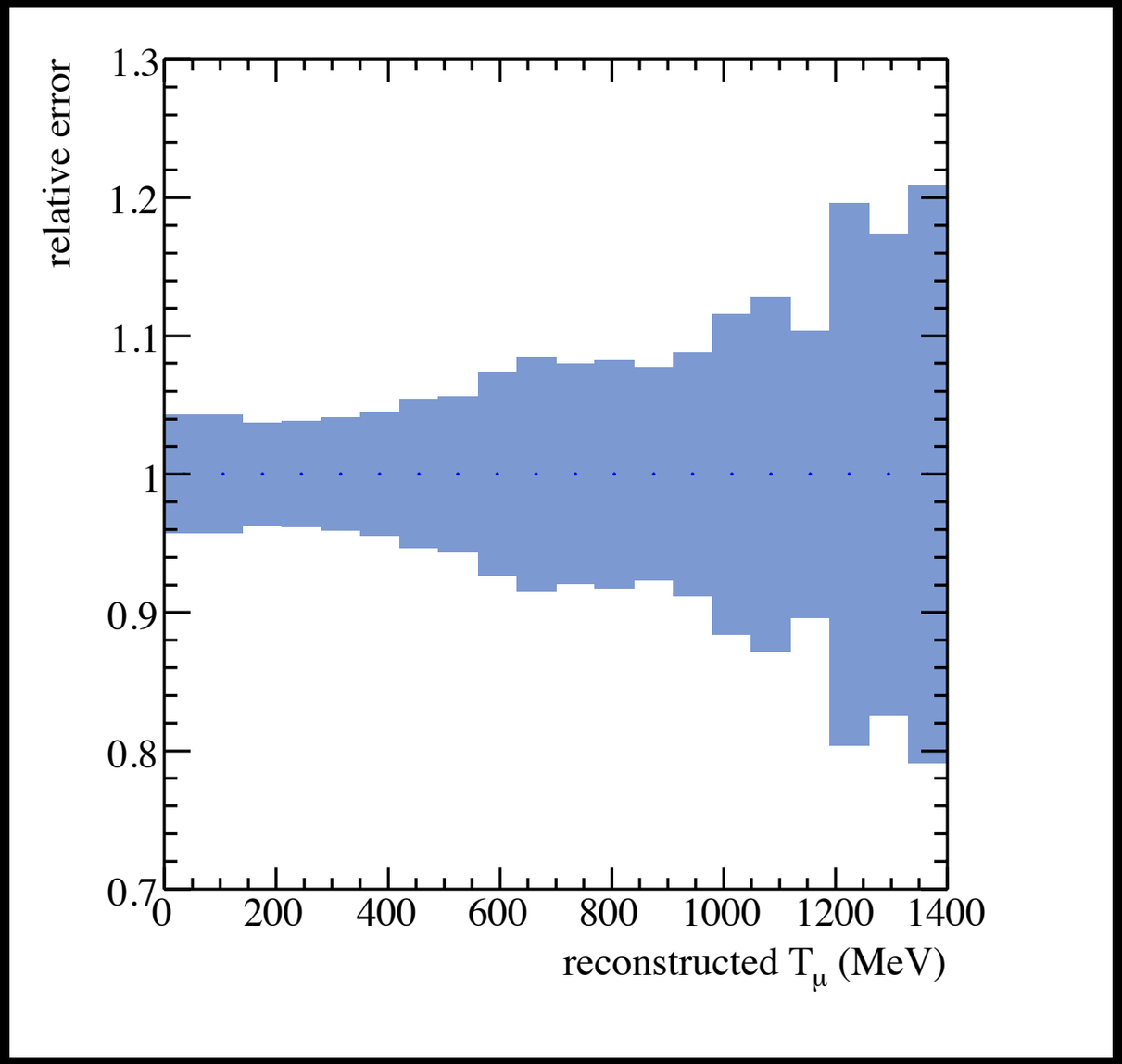


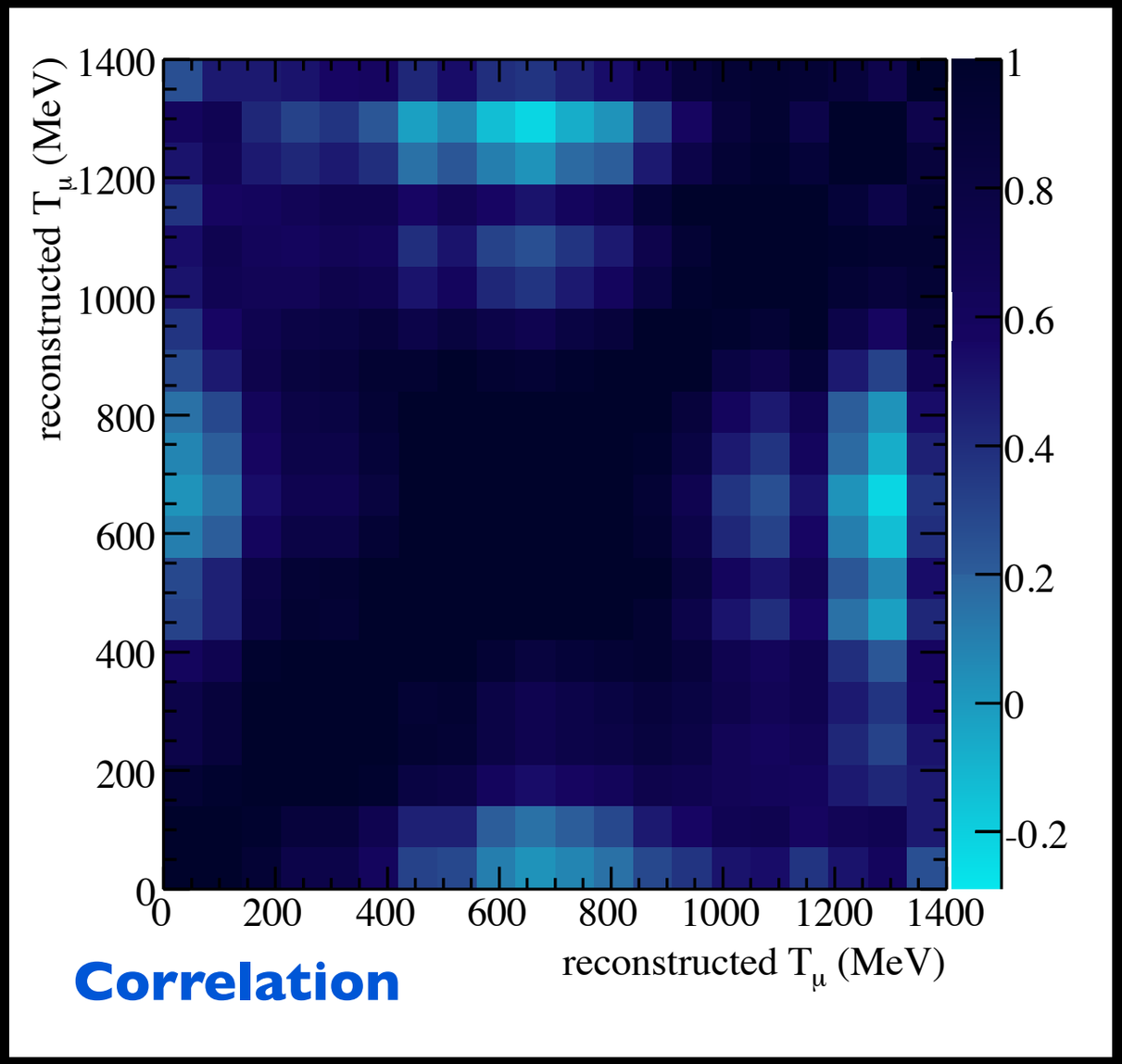




Beam π^+ errors

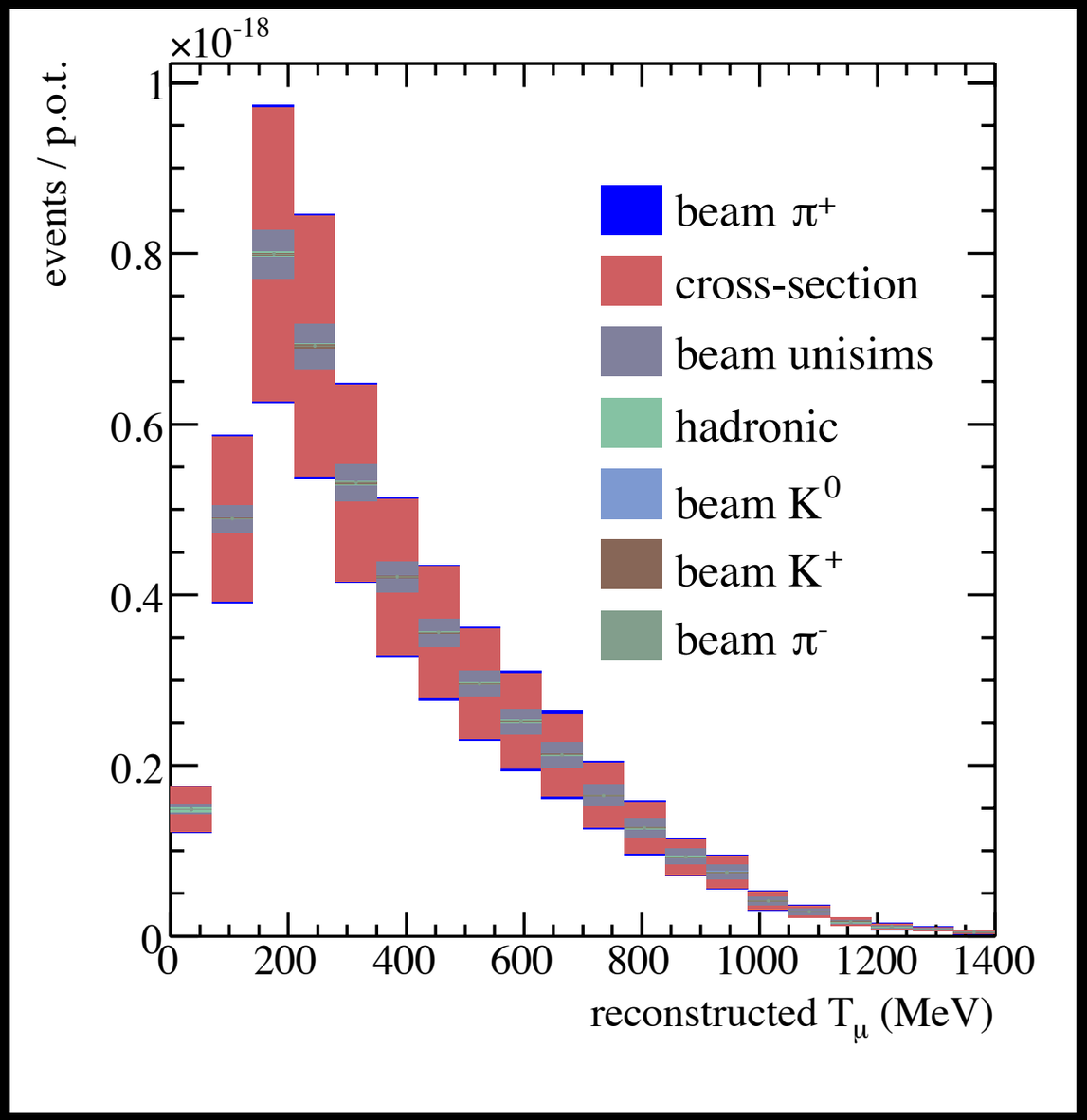
- The relative error and correlation matrix.

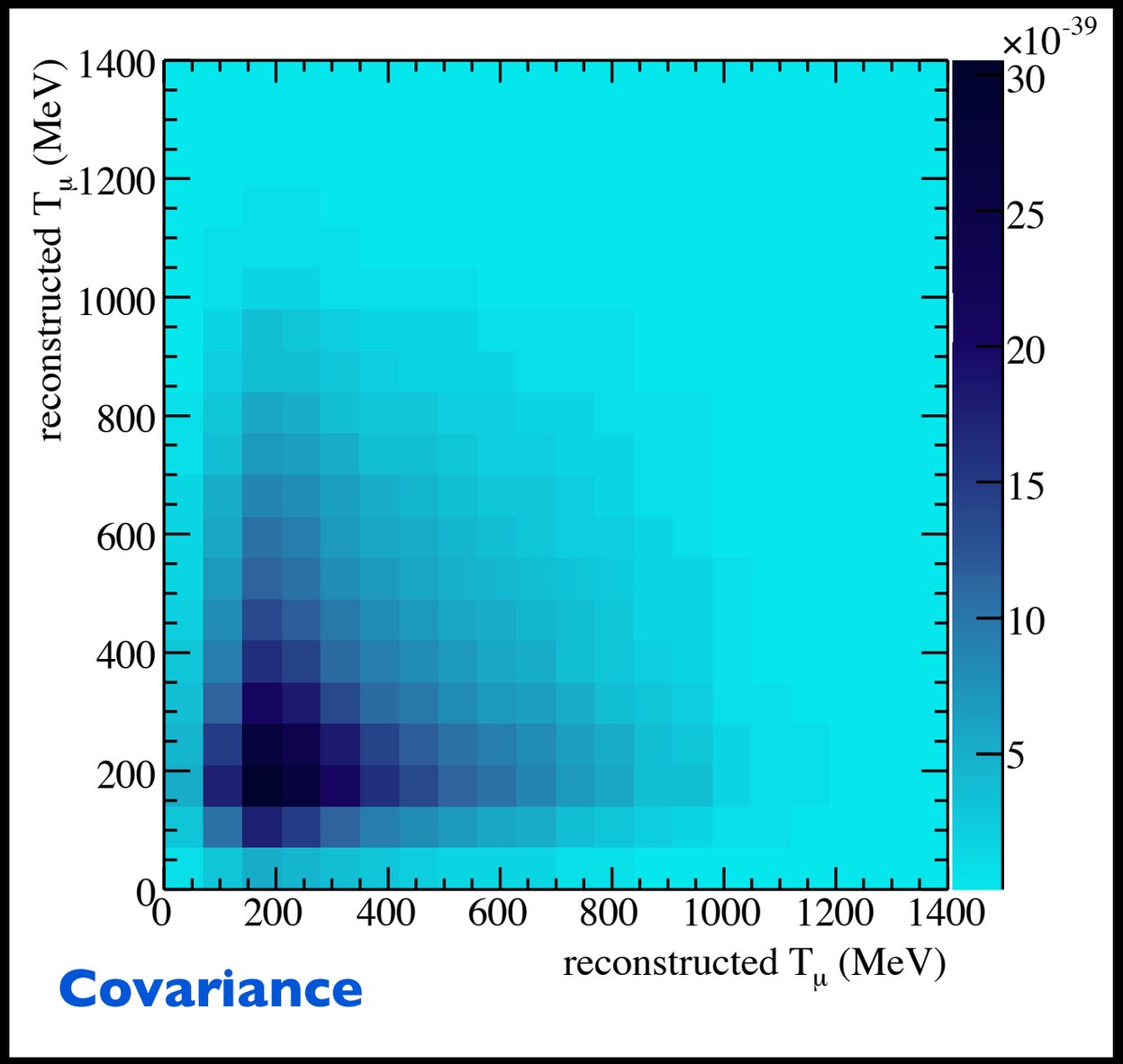




Additional errors

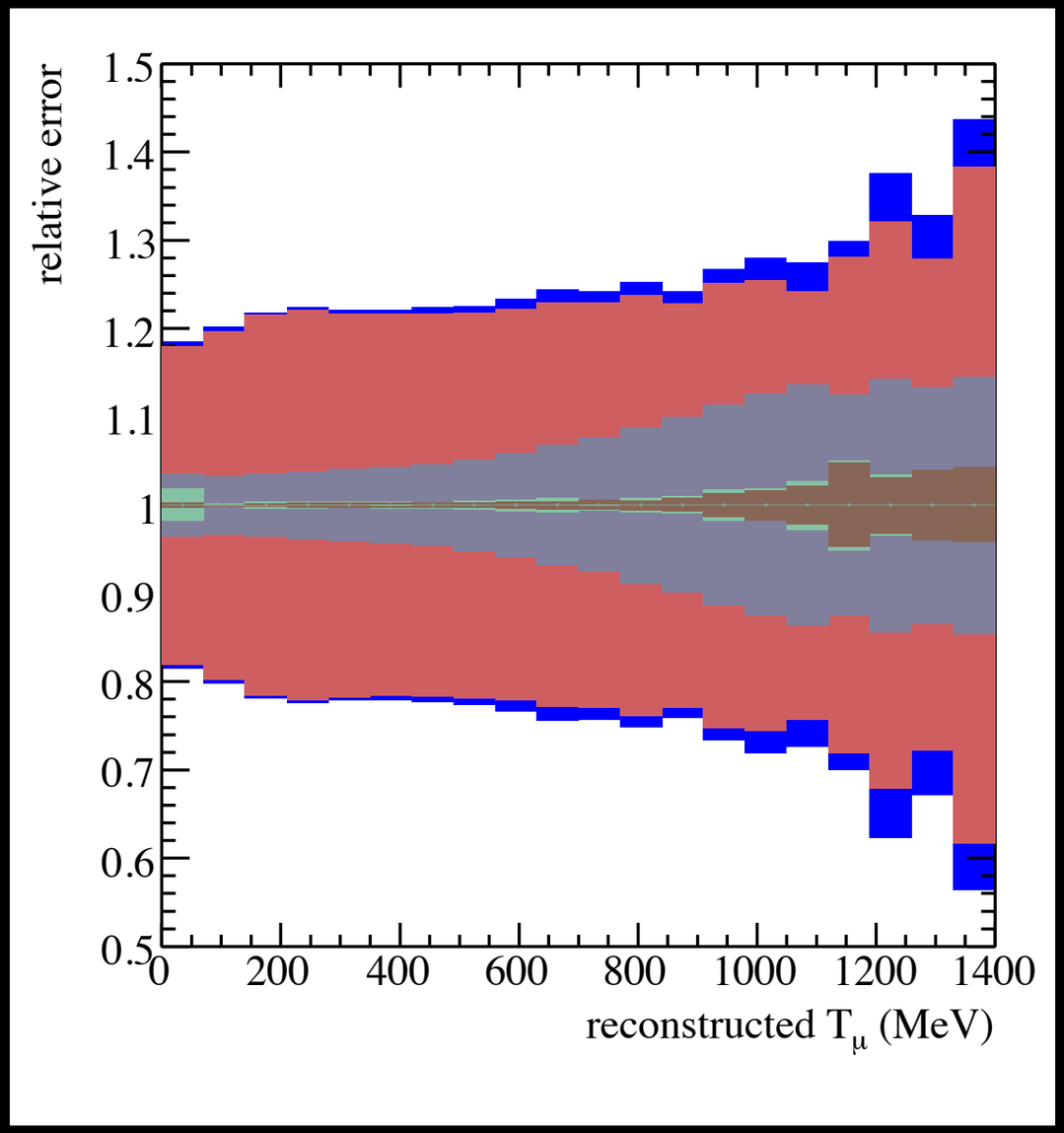
- I haven't sorted the errors from smallest to largest yet.
- I also need a less ugly choice of colors.

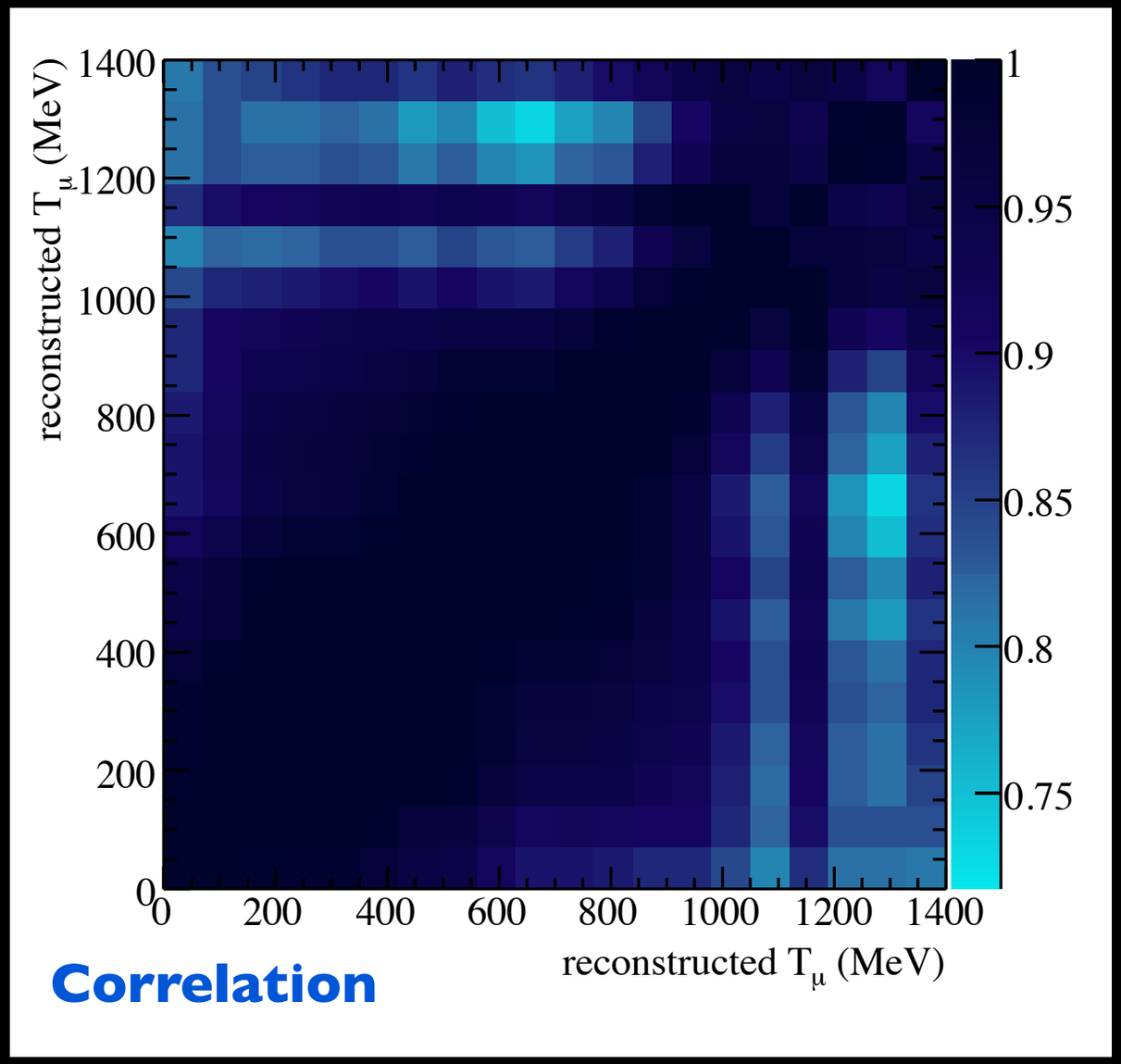




Additional errors

- The dominant error appears to be from cross-sections.
- Second are the beam unisims and then the beam π^+.
- Total normalization error is 22%.





OM Multisims

- Alas, 13 of my OM multisims have corrupt files that have kept me from looking at them yet.
- Once I remove those files I should be able to assess these errors.

Unfolding bias and systematic error

- The bias can be estimated as: $\mathbf{b} = (\mathbf{UBU} - \mathbf{U})\,\mathbf{d}$, where $\mathbf{U}$ is the unfolding matrix, $\mathbf{B}$ is the bin migration matrix, and $\mathbf{d}$ 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: $\mathbf{V}_{ij} = [(\mathbf{UBU} - \mathbf{U})\,\mathbf{d}]_i[(\mathbf{UBU} - \mathbf{U})\,\mathbf{d}]_j$ (Colin's method, correct me if I'm wrong).
- 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?