

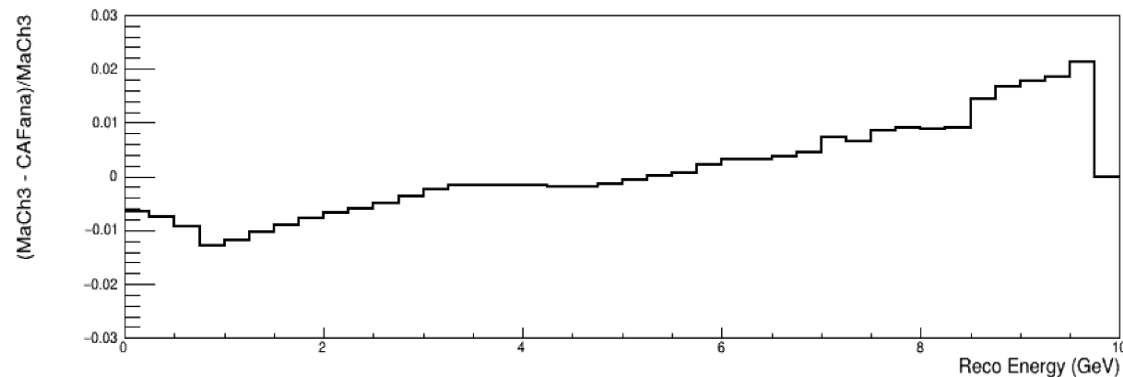
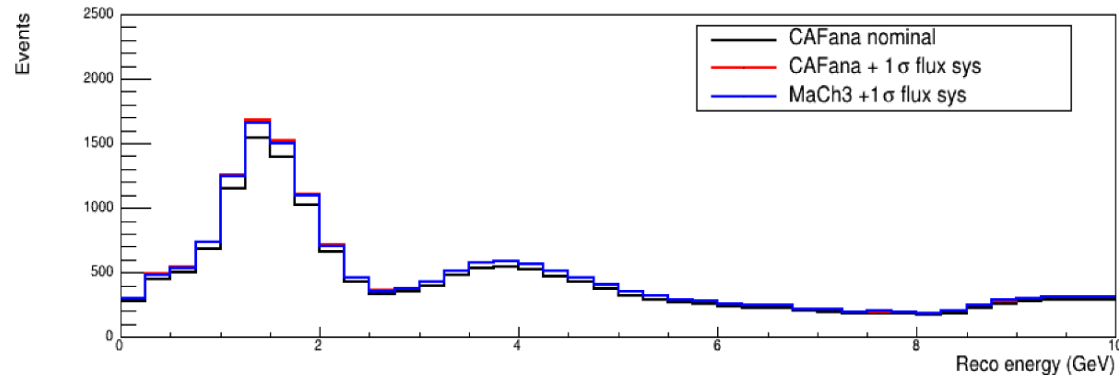
MaCh3 Status Update

Ed Atkin on behalf of the MaCh3 group



Flux systematics validations

- Validating flux systematics against CAFana
- Do 10k throws from covariance matrix and reweight FD prediction each time to calculate standard deviation in each bin
- $\sim 1\%$ differences seen between MaCh3 and CAFana

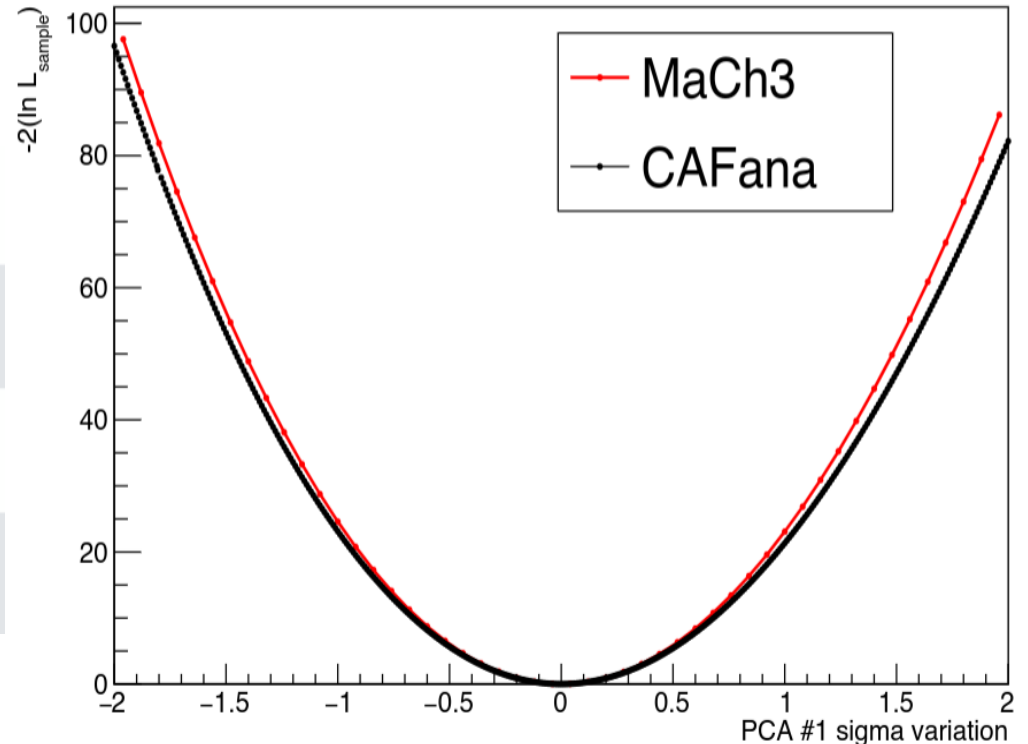


B. Radics

Flux systematics validations

- CAFana uses PCA'd flux whereas MaCh3 doesn't
- When debugging Balint PCA'd the flux covariance MaCh3 is using and found different values to CAFana
- Assume we're probably using slightly different flux covariance matrices which is causing the 1% difference seen

PCA component	CAFana	R	ROOT
1	1.70287	1.62003	1.62003
2	0.55459	1.48372	1.48372
3	0.21844	0.83184	0.83184



Other systematic implementations

- MaCh3 uses splines to evaluate a lot of cross section systematics
- To be able to make splines we need to make weights for certain systematic parameter values
- Liban has been working on this weight generation
- Now able to return weights for xsec systematics from GENIE using nusystematics (look the same as the values in the CAF file)
- Next step is to format the output file so that we can create spline files with our existing software

Summary

- Making good progress on implementing DUNE FD systematic parameters into MaCh3
- Flux uncertainty appears slightly different to CAFana but think this is due to differing flux covariance matrices
- Started to work towards implementing cross section parameters by making weights for variations of parameters