

KaonLT Meeting

February 26-27th, 2025

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Yield Comparisons

- Kin+Richard have successfully fixed the SIMC yield discrepancy.
 - The discrepancy came from a combination of cut mismatching, SIMC differences, and some miscommunication (e.g., what cuts files actually were using).
- Our total SIMC yields are consistent within ~1.7%, which is a result of our different initial SIMC files (Kin was not applying the geometric cuts).
 - We also ran the procedure using Kin's SIMC file and we got the same exact results.
- We are checking ratios/xsects for a final sanity checks
- Effect of cuts on SIMC yields (low epsilon)
 - MM+t cut ~20% decrease from no cut
 - MM+t+accept ~50% decrease from no cut
 - MM+t+accept+HGCer ~65% decrease from no cut
 - MM+t+accept+HGCer+Diamond ~80% decrease from no cut

Full Replay

- Start with best settings and work down
 - $Q2=3.0, W=3.14$
 - $Q2=4.4, W=2.74$
 - $Q2=2.115, W=2.95$
 - $Q2=3.0, W=2.32$
 - $Q2=5.5, W=3.02$
- Saving full replay AND skimmed root files to cache (skimmed was previously on volatile)
- Adding new trees with only CT cuts (no PID)
 - Use for detector systematics studies
 - Explicitly add PID cuts back in and vary for studies

Systematics (1)

- Start with best settings and work down
 - $Q2=3.0, W=3.14$
 - $Q2=4.4, W=2.74$
 - $Q2=2.115, W=2.95$
 - $Q2=3.0, W=2.32$
 - $Q2=5.5, W=3.02$
- Phase 1 [Kin+Rich]
 - For Data yields
 - Check how Data yields change
 - Compare Data yield results due to background subtraction procedures (Kin vs Rich)
 - MM+t+accept+HGCer+Diamond CUTS (+PID for Data)
 - Vary each individual cut
 - Check across t bins (% dif bin by bin per SHMS setting)
 - Check across SHMS settings (% diff SHMS setting by SHMS setting)
 - Check across epsilons (% diff epsilon by epsilon)

Systematics (2)

- Phase 2
 - For SIMC yields (fully iterated nominal yields)
 - Check how SIMC yields change
 - MM+t+accept+HG Cer+Diamond CUTS
 - Vary each individual cut
 - Check across t bins (% dif bin by bin per SHMS setting)
 - Check across SHMS settings (% diff SHMS setting by SHMS setting)
 - Check across epsilons (% diff epsilon by epsilon)
- Phase 3
 - Fixed cuts, offset shifts
 - Check how SIMC yields change
 - Check across t bins (% dif bin by bin per SHMS setting)
 - Check across SHMS settings (% diff SHMS setting by SHMS setting)
 - Check across epsilons (% diff epsilon by epsilon)

Systematics (3)

- Phase 4
 - Fixed cuts, radiative corrections
 - Check how SIMC yields change
 - Check across t bins (% dif bin by bin per SHMS setting)
 - Check across SHMS settings (% diff SHMS setting by SHMS setting)
 - Check across epsilons (% diff epsilon by epsilon)
- Phase 5
 - Fixed cuts, parameter/model shifts
 - Check how SIMC yields change
 - Check across t bins (% dif bin by bin per SHMS setting)
 - Check across SHMS settings (% diff SHMS setting by SHMS setting)
 - Check across epsilons (% diff epsilon by epsilon)

EXTRA