## KaonLTMeeting

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## Overview

# 1. SIMC Weight 

2. SIMC MM
3. MM PID Analysis
4. MM cut: Yield Comparison

## 1) SIMC Weight

- Problem: In order to get Ydata/Ysimc to be even close to unity I need to divide the SIMC weight by $10^{6}$
- Solution: I was applying the weight for the histograms but not binned data
- Typo from rewriting binning script, D'oh!



Ignore error bars for now...(purposefully set very large for testing)

## 2) SIMC MM

- Problem: Very long radiative tail (??) for SIMC MM distribution
- Solutions:
- Dave checked over my input file and splash output. Incorrect decay length being used ( $\pi$ rather than K )
- MM was not being recalculated by recon_hcana script


```
M_recoil = fB.M(); //recoil mass (neutron missing mass)
Mpi = sqrt(abs((pow(Em+(sqrt((MP*MP)+(pow((Pf_vec.Mag()), 2))))-(sart((mpi*mpi)+(pow((Pf_vec.Mag()), 2)))), 2)-(Pm*Pm))));
MMK = sqrt(abs((pow(Em+(sqrt((MP*MP)+(pow((Pf_vec.Mag()), 2))))-(sqrt((mk*mk)+(pow((Pf_vec.Mag()), 2)))), 2)-(Pm*Pm))));
MMp = sqrt(abs((Em*Em)-(Pm*Pm)));

\section*{2) MM PID Analvsis}
- Problem: Dealing with leak through and other \(\mathrm{K}^{+}\) channels

\section*{\(Q^{2}=2.115\) \\ Center Low eps}


\section*{3) MM PID Analysis}
- Problem: MM PID cut analysis
- Two MM regions analyzed
- \(M M<1.05\)
- \(M M>1.16\)


\section*{3) \(\mathrm{MM}<1.05\)}
- Events clearly seen in SHMS aerogel below about 5 NPE. Perhaps an aero \(>4.5\) cut.
- Such a cut will greatly help low eps but high still has significant leakage from protons
- High eps will require pion leak subtraction



Center



Left


\section*{3) \(\mathrm{MM}<1.05\)}


\section*{\(Q^{2}=2.115\)}

High eps


\section*{3) \(\mathrm{MM}>1.16\)}
- That aero > 4.5 or so cut should also clean up this as well but still lots of leakage/higher channels


\section*{\(Q^{2}=2.115\)}

Low eps

3) \(M M>1.16\)

\(\mathrm{Q}^{2}=2.115\)
High eps

4) MM cut: Yield Comparis
- I was curious how an initial MM cut would affect the yield
- 1.10 < MM < 1.18



\section*{4) MM cut: Yield Comparison}
\(\mathrm{MM}_{\mathrm{K}}\)
- I was curious how an initial MM cut would affect the yield
- 1.10 < MM < 1.18


\section*{4) MM cut: Yield Comparison}

\section*{\(Q^{2}=2.115\)}

\section*{Low eps}
- Shockingly good agreement for both high and low eps

\section*{High eps}





\section*{4) MM cut: Ratio Comparison}
- MM cut ratios are a bit better also


Ignore error bars for
\(Q^{2}=2.115\) now...(purposefully set very large for testing)






\section*{4) MM cut: Separated xsect Comparison}

\section*{\(Q^{2}=2.115\)}

No MM cut






Ignore error bars for now...(purposefully set very large for testing)```

