

KaonLT Analysis Update (SIMC Resolution Study)

Ali Usman

Feb 15, 2024

University of Regina

Preview

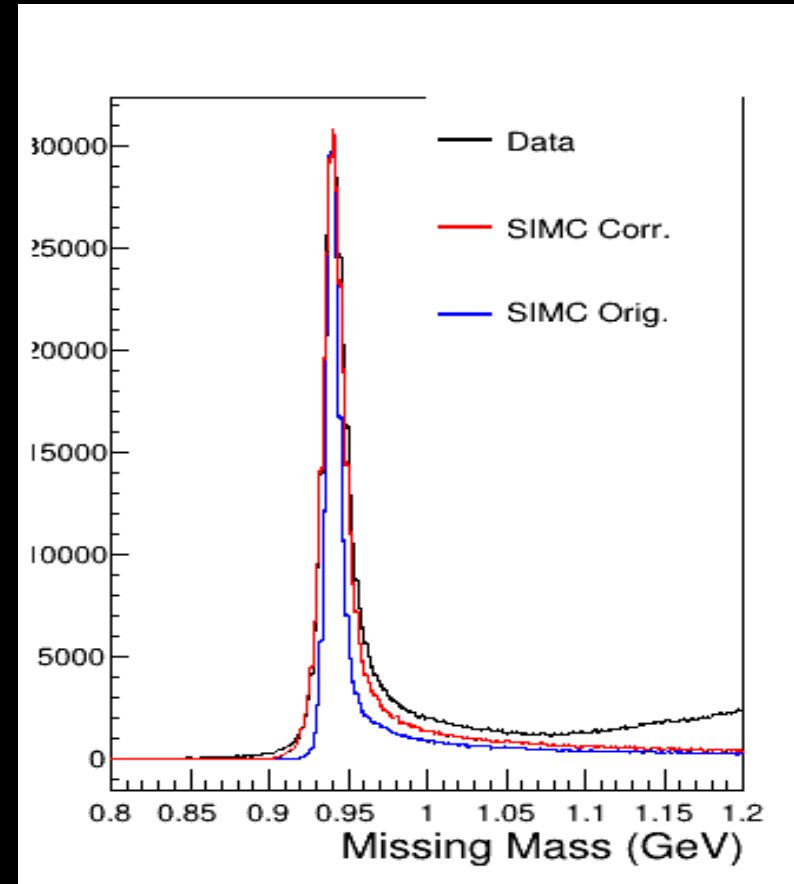
- Kaon-LT data taken at 10.6 GeV (high e) has resolution mis-match
- Using Pi-n data and simc to study resolution miss-match.
- Data distributions are from the most recent full pass replay completed in Dec-Jan
 - These include kinematic offsets and cointime/beta leakage correction.
- SIMC distributions are also offset corrected.
 - Initial plots only with SHMS DC resolution tuning

Kinematic Settings

E (GeV)	Q^2 (GeV ²)	W (GeV)	x_B
10.6	5.5	3.02	0.40
10.6	4.4	2.74	0.40
10.6	3.0	3.14	0.25
10.6	3.0	2.32	0.40
10.6	2.115	2.95	0.21

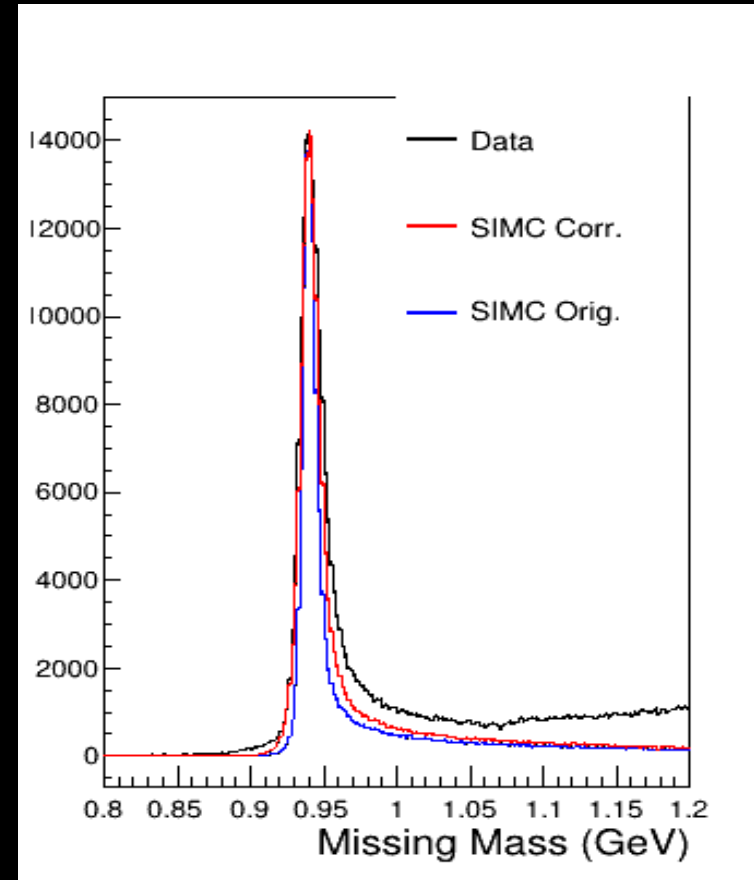
$Q^2 = 2.1$, $W = 2.95$ (center)

- P (HMS) = 5.2867 GeV
- Angle (HMS) = 11.217
- P (SHMS) = 4.9730 GeV
- Angle (SHMS) = 10.798



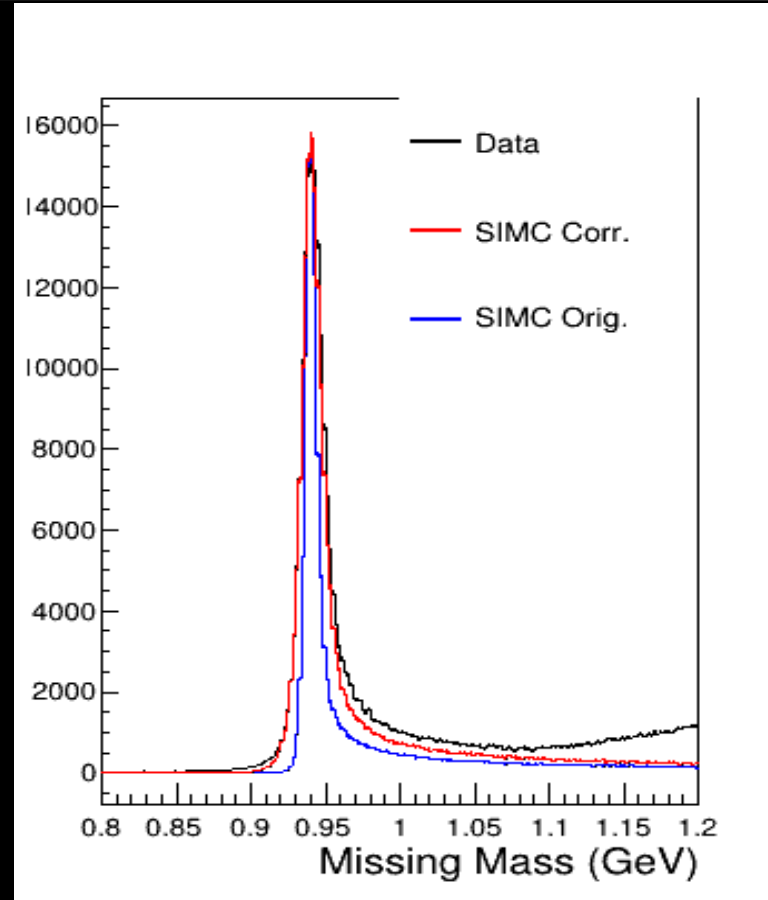
$Q^2 = 3.0$, $W = 2.32$ (center)

- P (HMS) = 6.5834
- Angle (HMS) = 11.967
- P (SHMS) = 3.4790
- Angle (SHMS) = 18.238



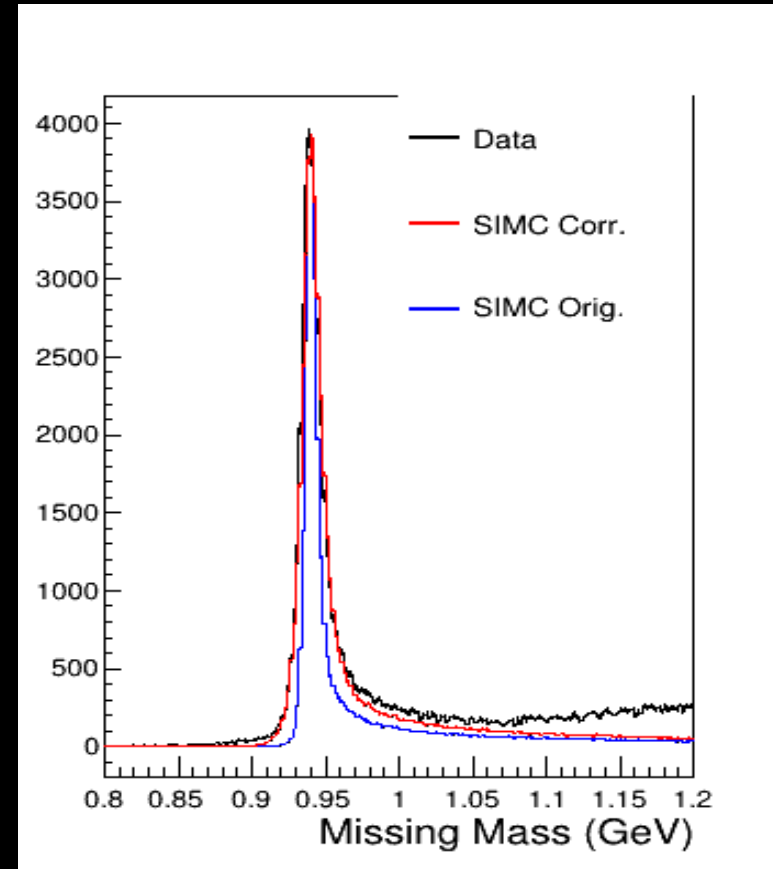
$Q^2 = 3.0$, $W = 3.14$ (center)

- P (HMS) = 4.1998
- Angle (HMS) = 14.987
- P (SHMS) = 6.0409
- Angle (SHMS) = 9.473



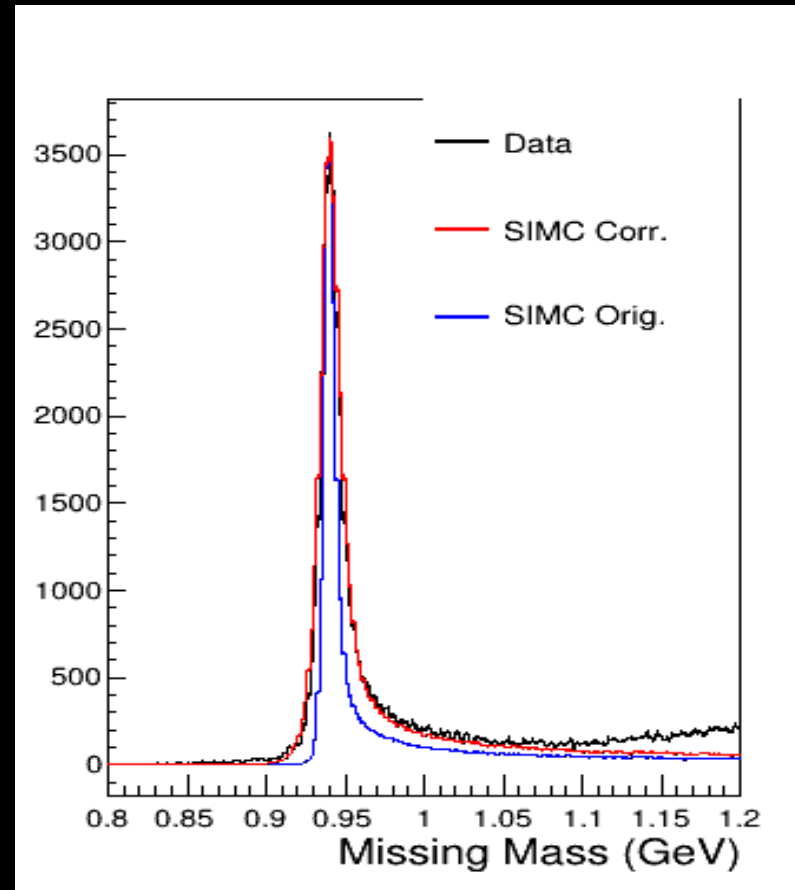
$Q^2 = 4.4$, $W = 2.74$ (center)

- P (HMS) = 4.7073
- Angle (HMS) = 17.132
- P (SHMS) = 5.3782
- Angle (SHMS) = 12.873

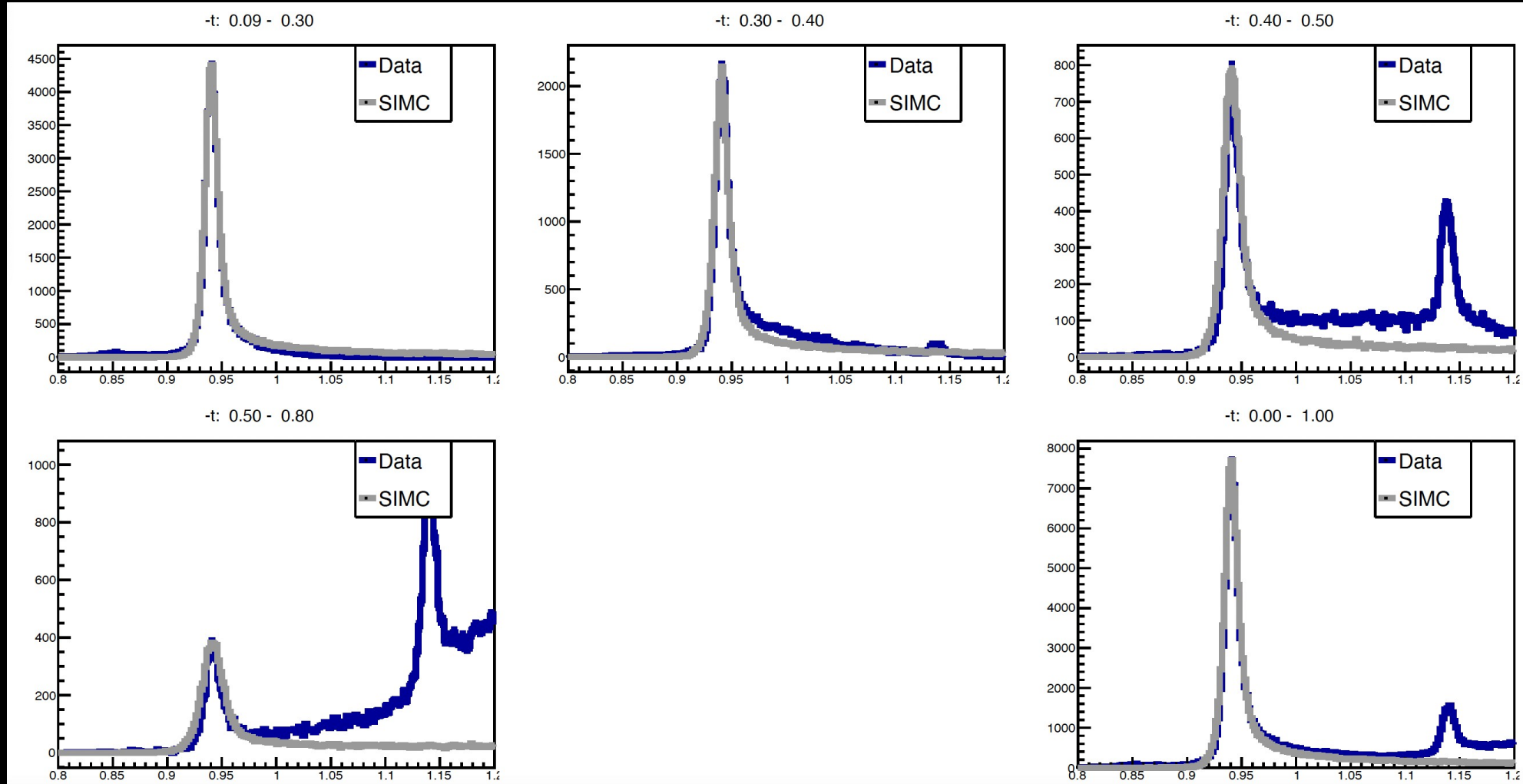


$Q2 = 5.5, W = 3.02$ (center)

- P (HMS) = 3.2627
- Angle (HMS) = 23.057
- P (SHMS) = 6.8283
- Angle (SHMS) = 9.613

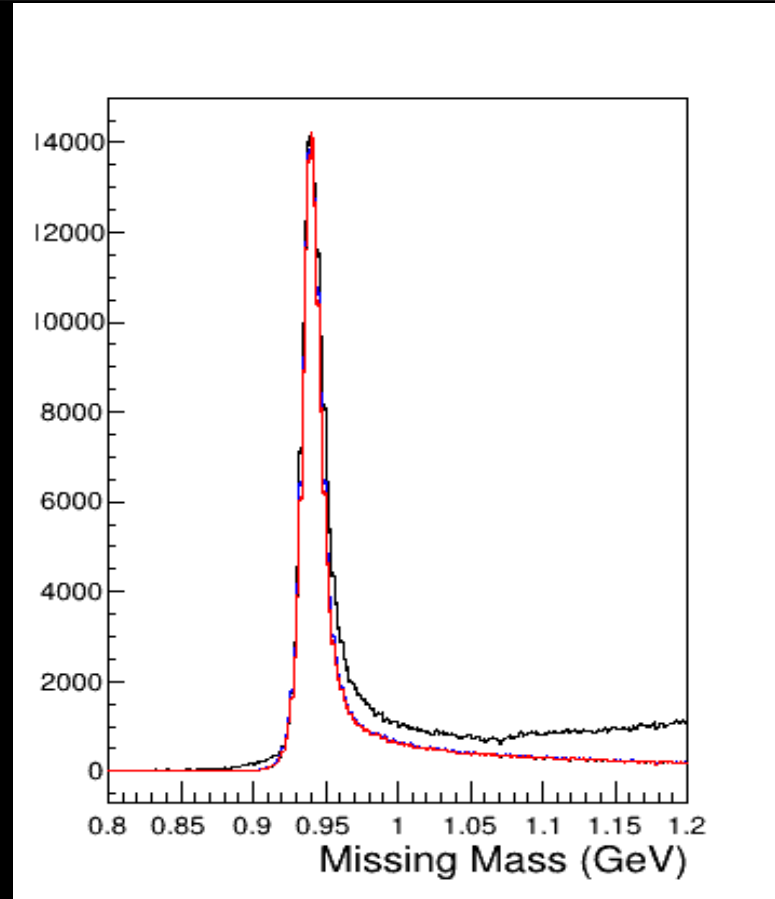


t- bin $Q^2 = 5.5$, $W = 3.02$ (center)



$Q2 = 3.0$, $W = 2.32$ (center)

- Adding the HMS DC resolution correction from Dave/Abhyuday
- P (HMS) = 6.5834
- Angle (HMS) = 11.967
- P (SHMS) = 3.4790
- Angle (SHMS) = 18.238
- No significant improvement.



Summary and Outlook

- Started testing SIMC SHMS DC resolution for all kinematics (10.6 GeV data).
 - Overall good agreement with uncorrected data
 - Lower HMS momenta have better agreement
- T-binned distribution look good overall with minor fluctuations.
- HMS DC resolution didn't have significant effect.
- May need to redo SHMS DC resolution if data correction is implemented.