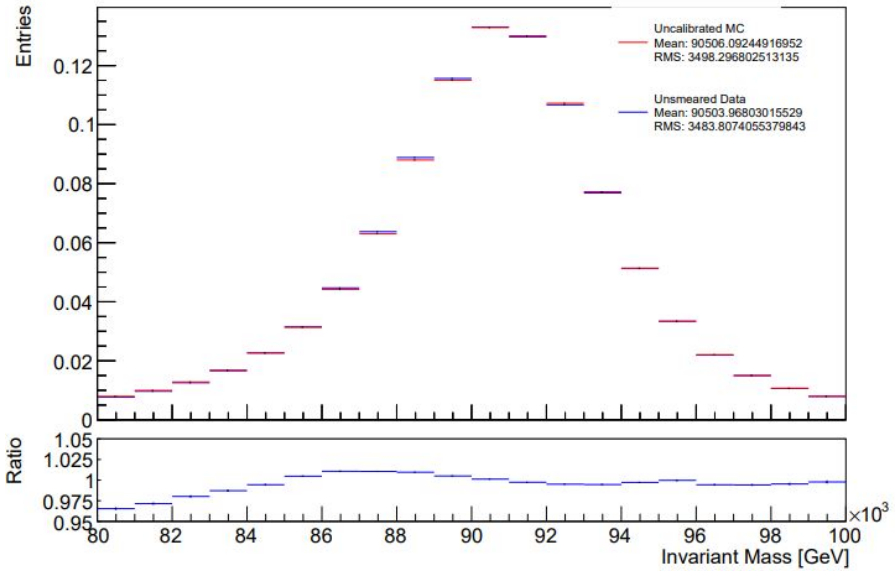
Quick Summary

To-Do:

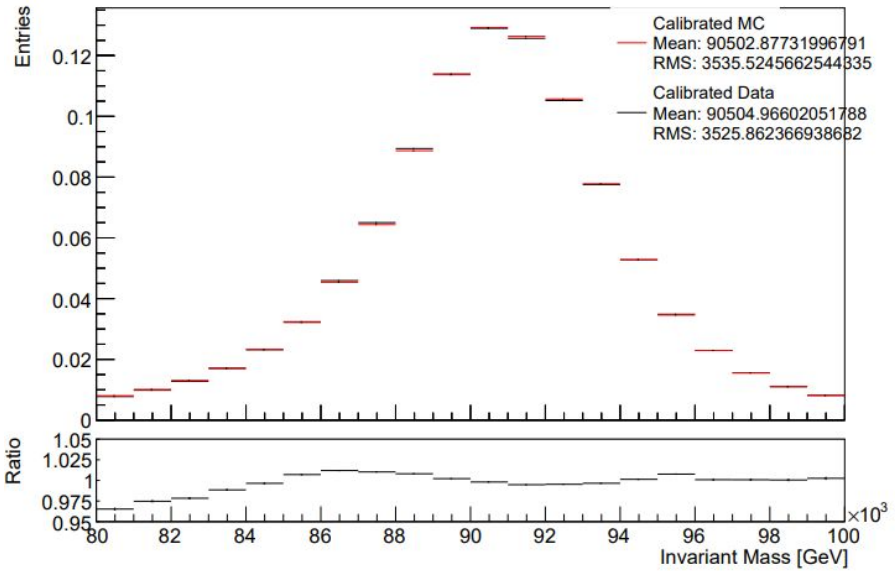
- Repeat categorisation, reweighting and calibration of pseudodata with born events
- Include background for Z→ee sample to see if high mass deviation gets corrected
- Repeat reweighting with events only in barrel/endcap
- Make phi distribution of events in first segment (delta eta < 0.025) to check proportion that are further from barycenter while still in cluster

Pseudodata Calibration

Pre-insitu



Post-insitu



Full MC sample categorised into “pseudodata” samples based on segments (if events contains AT LEAST one electron in segment “X”, it is placed in category “X”)

Pseudodata (after 1% smearing injection) is calibrated against the full MC sample using the normal in-situ calibration method (Example shown for **Segment 1: 0.0 - 0.025**)

Calibration does not fully remove tails - repeated for exclusive segments

Pseudodata Reweighting Results (Optimised)

Continuing investigation of effects of changing proportion of events from each segment

After some initial, strange results (fits not converging, especially when using the negative log likelihood method) started normalising the full, un-weighted MC to the data before fitting

Results show that chi squared and negative log likelihood give similar weights:

Chi Squared - Pre-normalised data and MC:

Fitted weights: [0.57496483, 0.94606719, 0.95579646, 0.98644989, 1.00940794, 1.31974361, 1.21897932]

Chi_2: 731.6769263536437

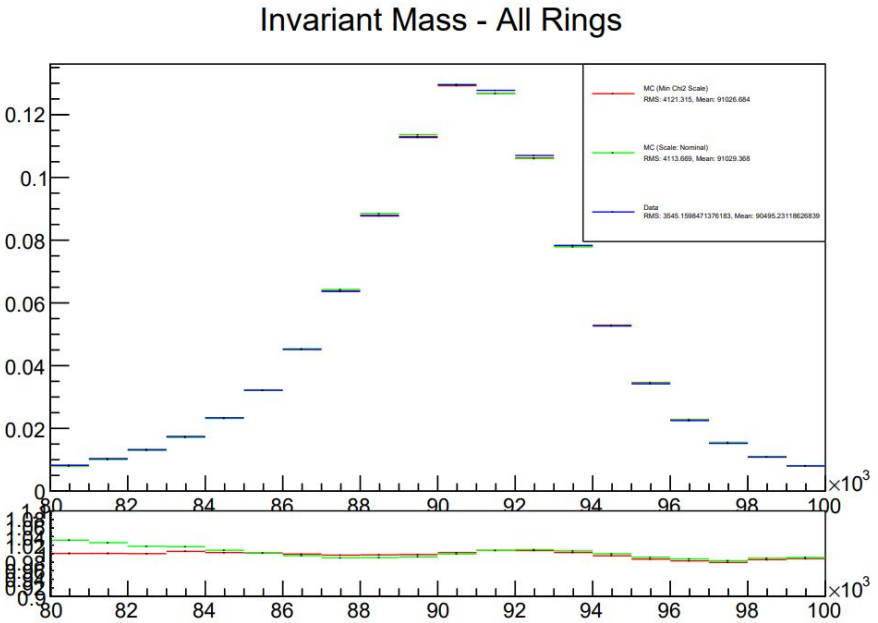
Chi_2_NDF: 38.50931191334967

Neg Log Likelihood - Pre-normalised data and MC:

Fitted weights: [0.5769822, 0.9570898, 0.94606284, 0.98994506, 1.01519951, 1.33165995, 1.22575883]

Chi_2: 731.642818746387

Chi_2_NDF: 38.507516776125634



Results shown for neg log likelihood fit

Pseudodata Reweighting Results (Barrel - Barrel)

Continuing investigation of effects of changing proportion of events from each segment

Strange results from both Barrel-Barrel and Endcap-Endcap event selections. Initial MC-data agreement is much worse than full MC sample, despite normalising data and MC before reweighting, resulting in more extreme scaling of segment distributions

Chi Squared - Pre-normalised data and MC:

Fitted weights: [0.0, 0.0, 0.18236353, 92.03612854, 0.0, 7.38262954, 6.46009256]

Chi_2: 2952.338239655121

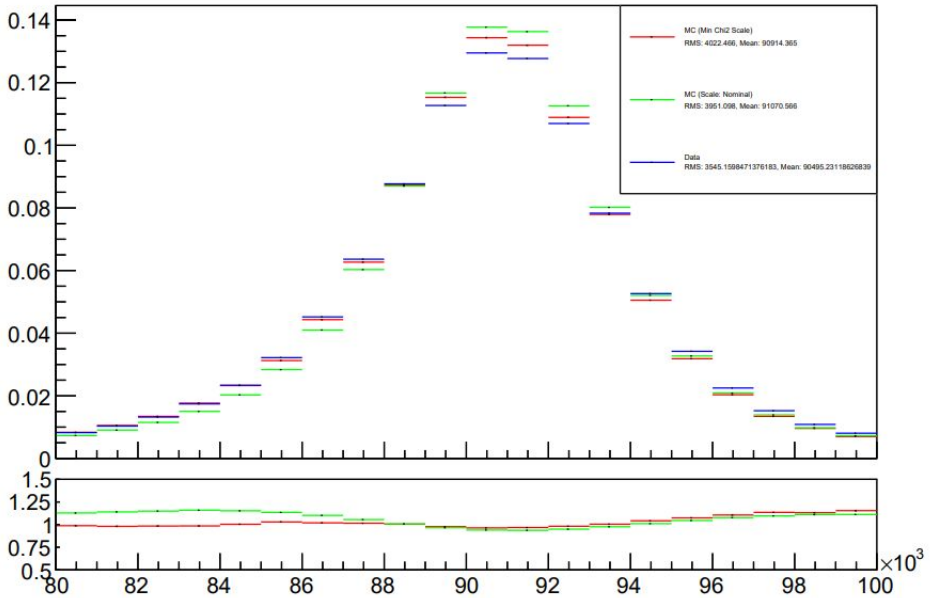
Chi_2_NDF: 155.3862231397432

Neg Log Likelihood - Pre-normalised data and MC:

Fitted weights: [0.0, 0.0, 0.0, 47.89364832, 0.0, 3.20419876, 3.1030744]

Chi_2: 2377.1224714217283

Chi_2_NDF: 125.11170902219622



Results shown for neg log likelihood fit

Pseudodata Reweighting Results (Endcap - Endcap)

Continuing investigation of effects of changing proportion of events from each segment

Strange results from both Barrel-Barrel and Endcap-Endcap event selections. Initial MC-data agreement is much worse than full MC sample, despite normalising data and MC before reweighting, resulting in more extreme scaling of segment distributions

Chi Squared - Pre-normalised data and MC:

Fitted weights: [0.0, 0.0, 0.0, 0.0, 0.78620793, 0.0, 2.69710466]

Chi_2: 5968.634621492356

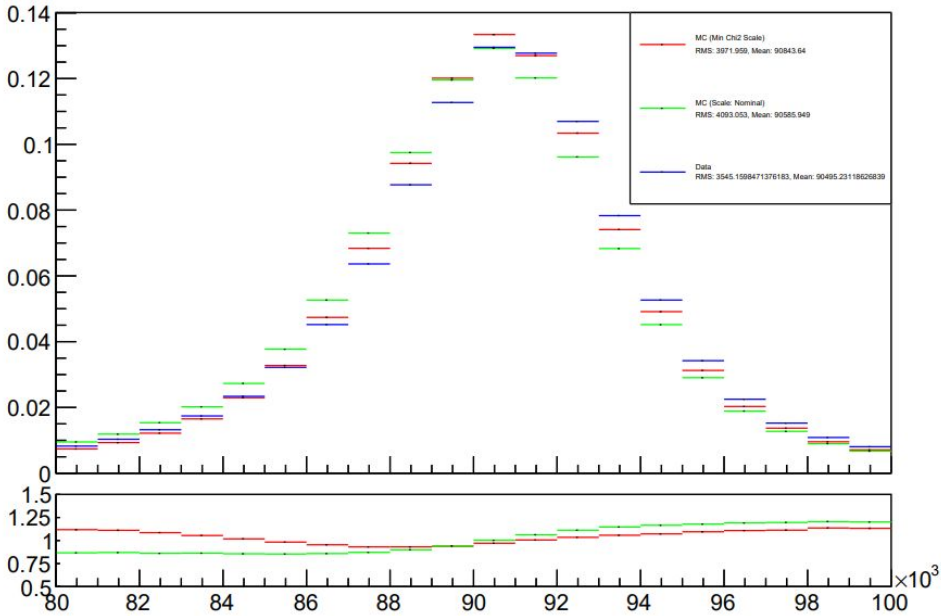
Chi_2_NDF: 314.13866428907136

Neg Log Likelihood - Pre-normalised data and MC:

Fitted weights:

Chi_2: 5968.694053506332

Chi_2_NDF: 314.141792289807



Results shown for neg log likelihood fit