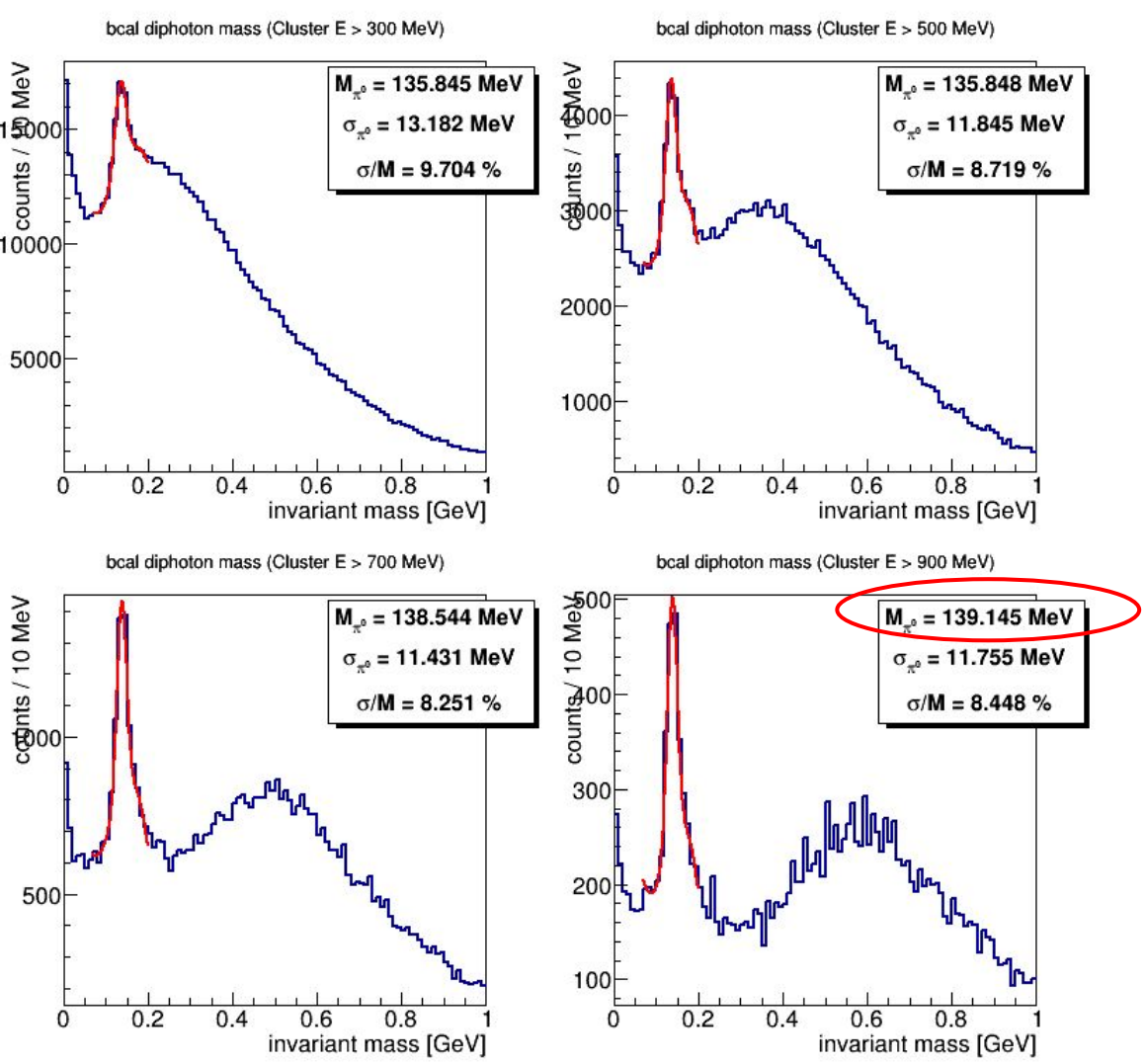
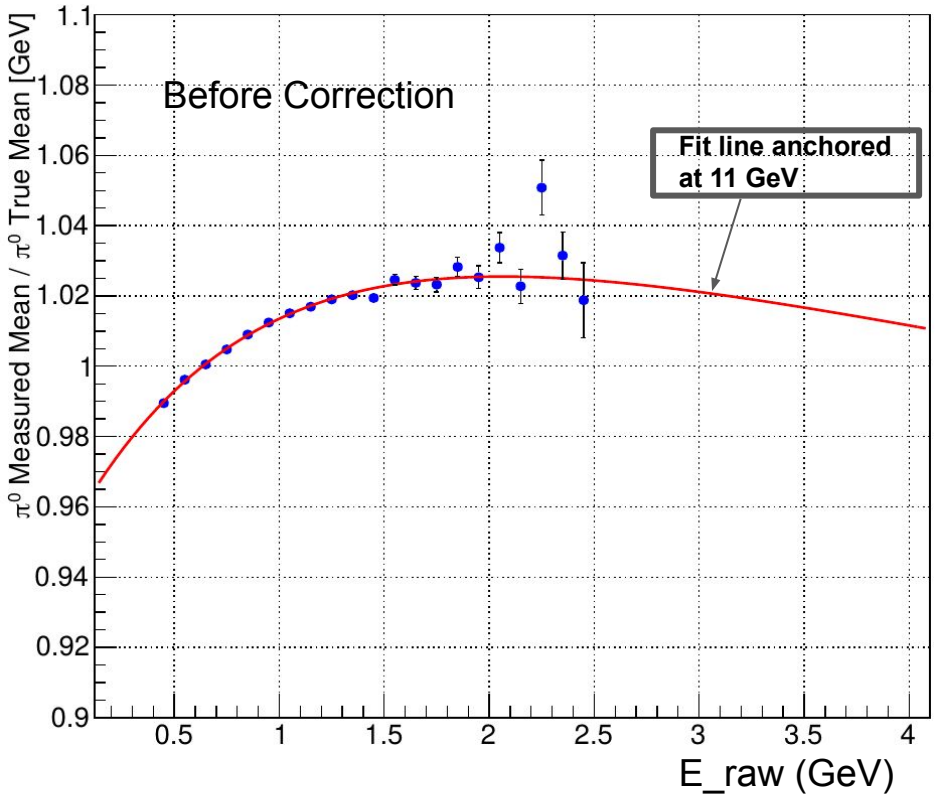
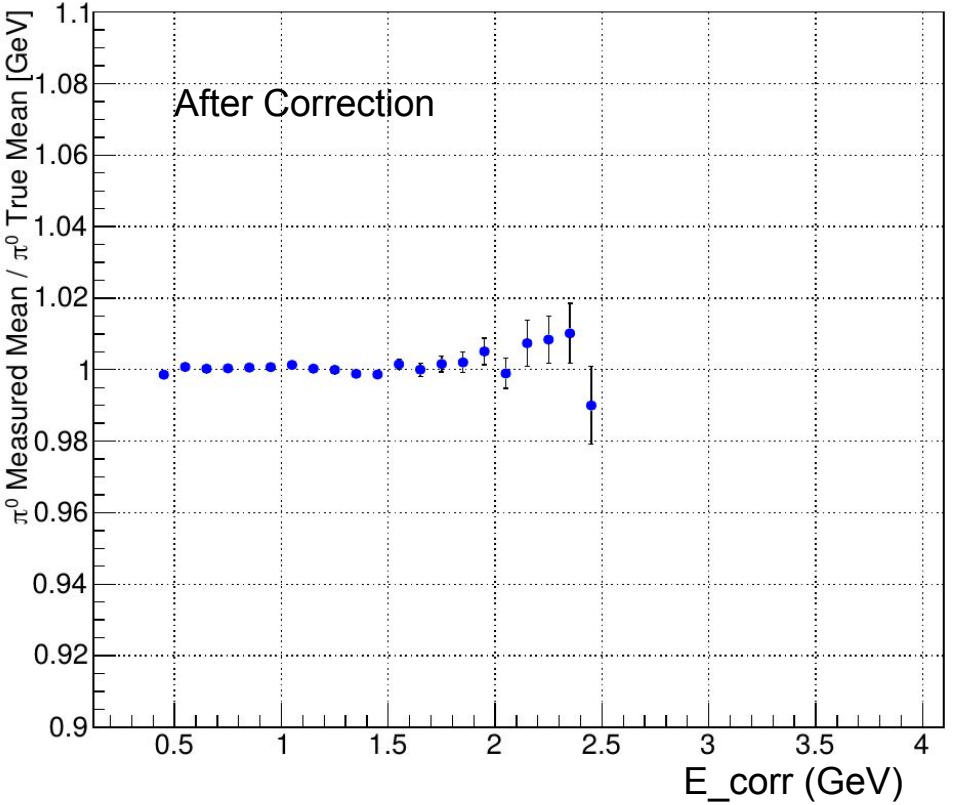
Nonlinearity Update

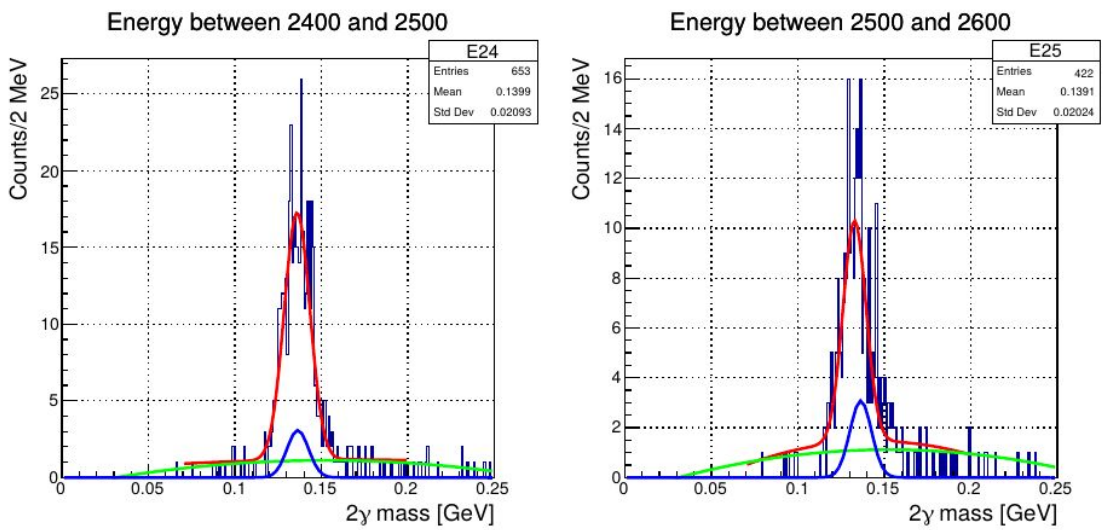
28th May 2020

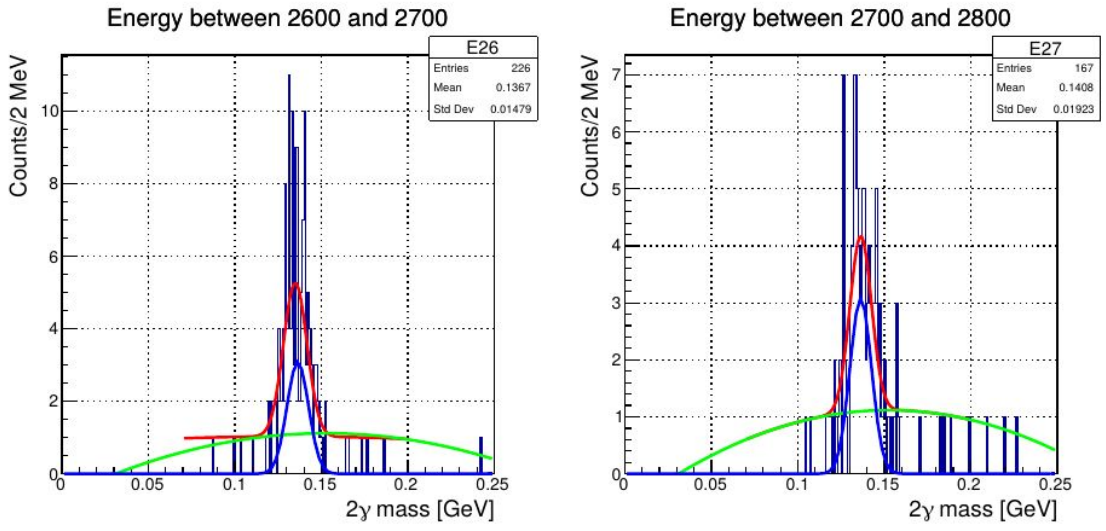


- The recent monitoring launch for PrimEx shows higher mass for 2 gamma mass in higher photon energies
- This is consistent for all the runs in the monitoring launches
- This could be due to over correcting for nonlinearity at higher energies


Before Correction
Fit line anchored at 11 GeV
π^0 Measured Mean / π^0 True Mean [GeV]
E_raw (GeV)
1.1
1.08
1.06
1.04
1.02
1
0.98
0.96
0.94
0.92
0.9
0.5
1
1.5
2
2.5
3
3.5
4

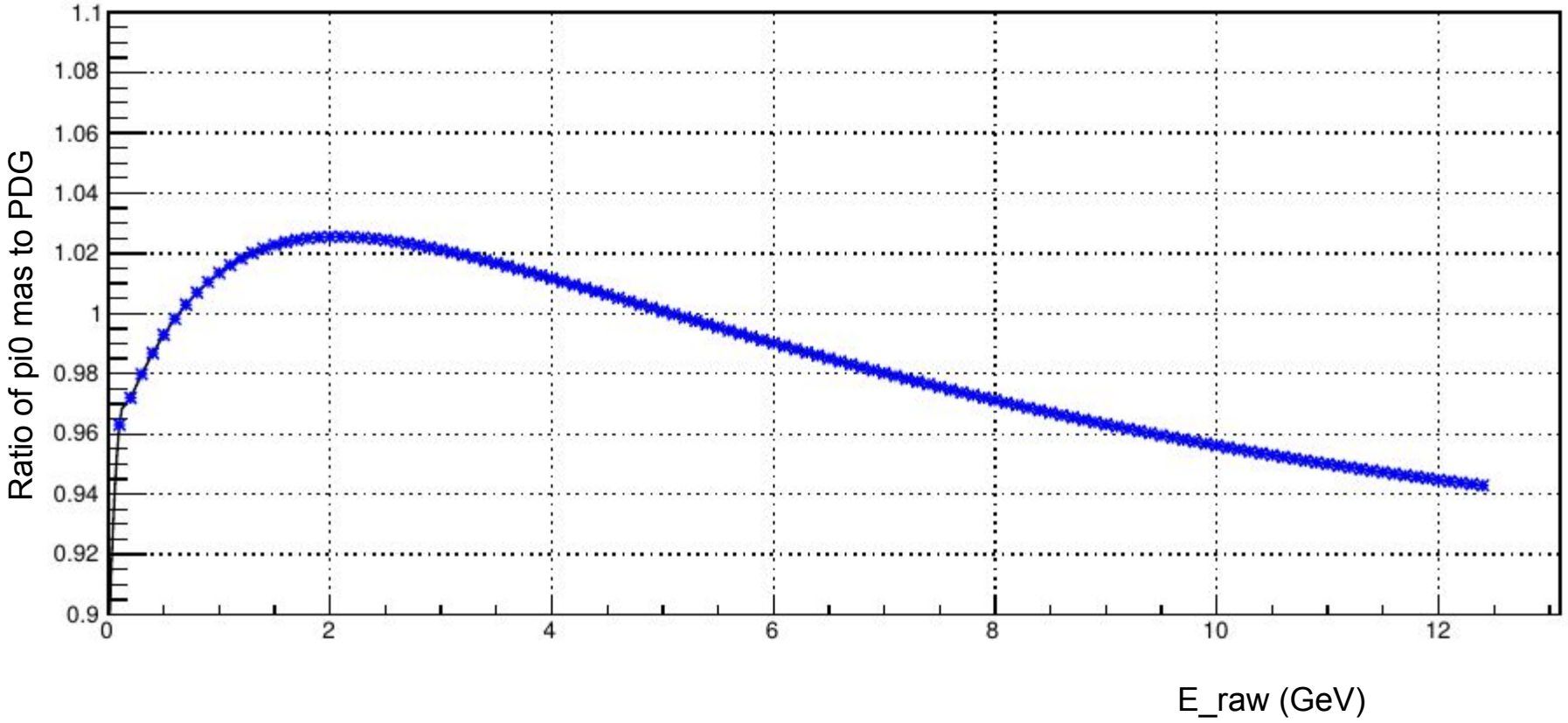

After Correction
π^0 Measured Mean / π^0 True Mean [GeV]
E_corr (GeV)
1.1
1.08
1.06
1.04
1.02
1
0.98
0.96
0.94
0.92
0.9
0.5
1
1.5
2
2.5
3
3.5
4

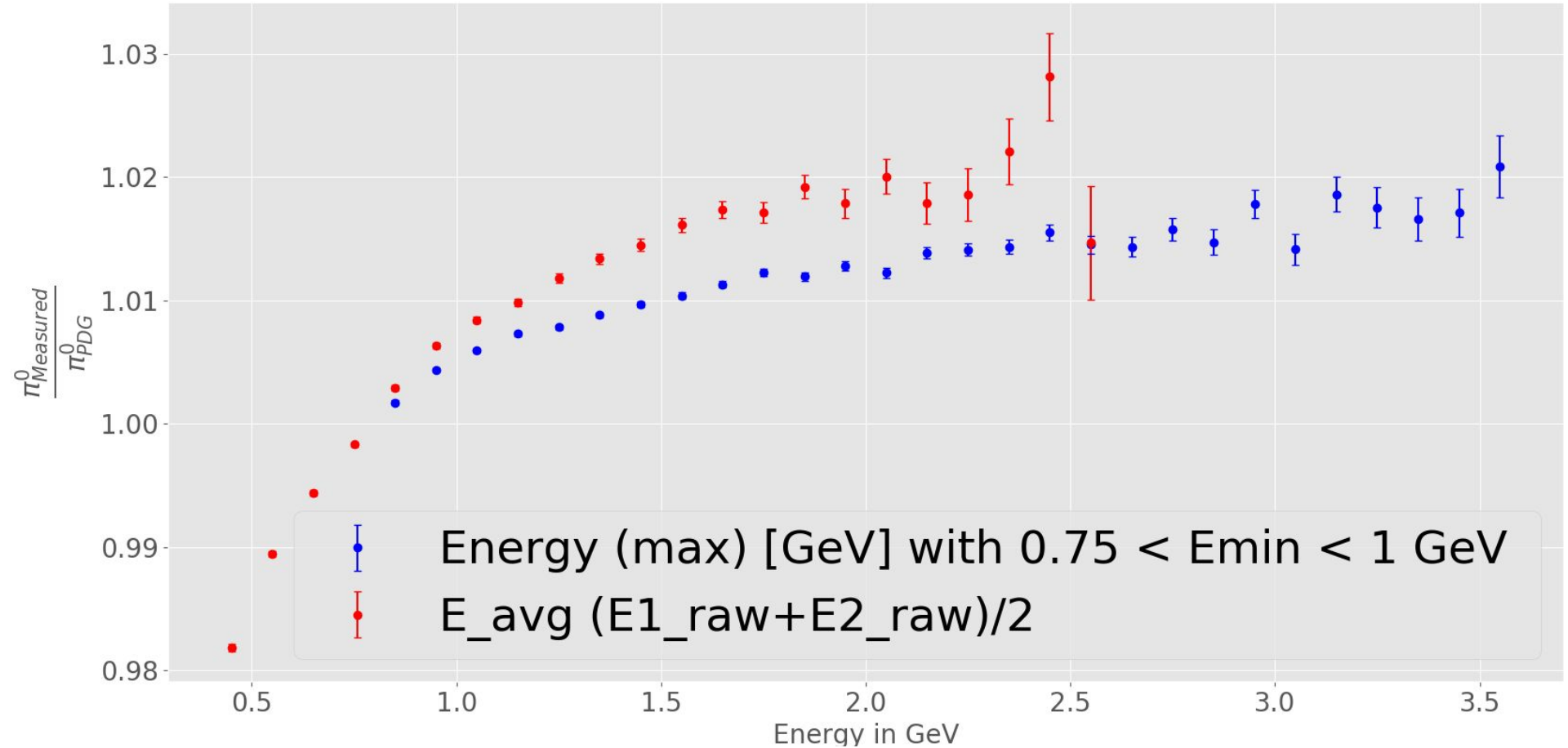




- No enough statistics for higher energies in the symmetric case beyond 2.5 GeV

Extrapolation of the fit function upto 12 GeV in Energy





There is systematics in the blue point of the order of 1%. However, It seems we are over correcting for mass in the higher energies.

BACKUPS

Anchor point study. Various lines are extrapolations of the points but anchored at different anchor points. These functions are inverted and are used to correct the energies