



Simulation Statistics

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Contents

2D histograms for parameterizing the variation of average energy deposition with pseudorapidity (η) and polar angle (θ) for all proposed ECCE calorimeters (CEMC, EEMC, FEMC, FHCAL, HCALIN, HCALOUT) using uni-energetic muons.

Simulation Parameters

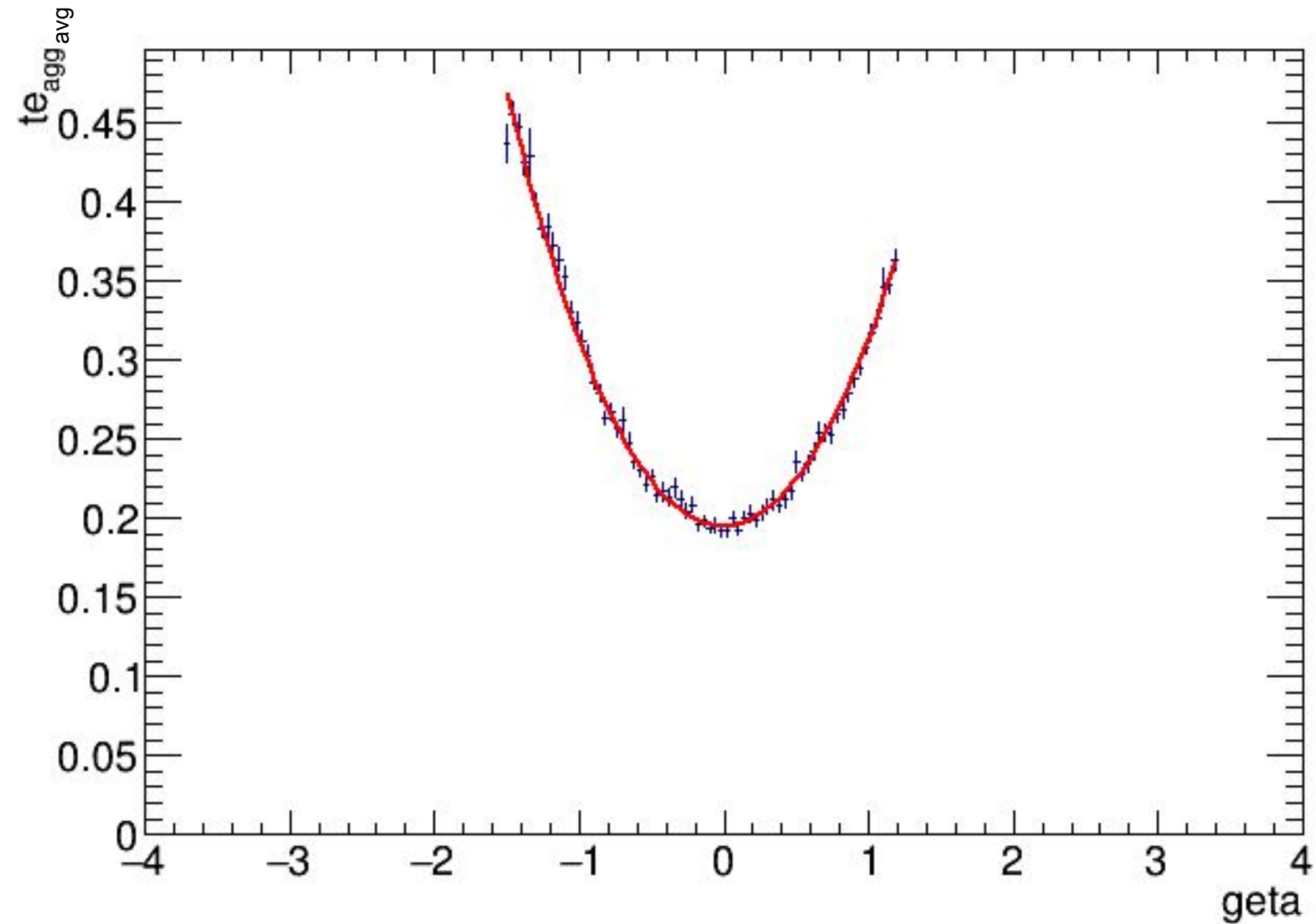
- Particles: μ^-
- Events: 46900 (μ^-)
- momentum (p): 4 GeV/c
- Pseudorapidity (η): -4 to 4
- Azimuth (Φ): $-\pi$ to π

Cuts:

- Detector-wise η cuts

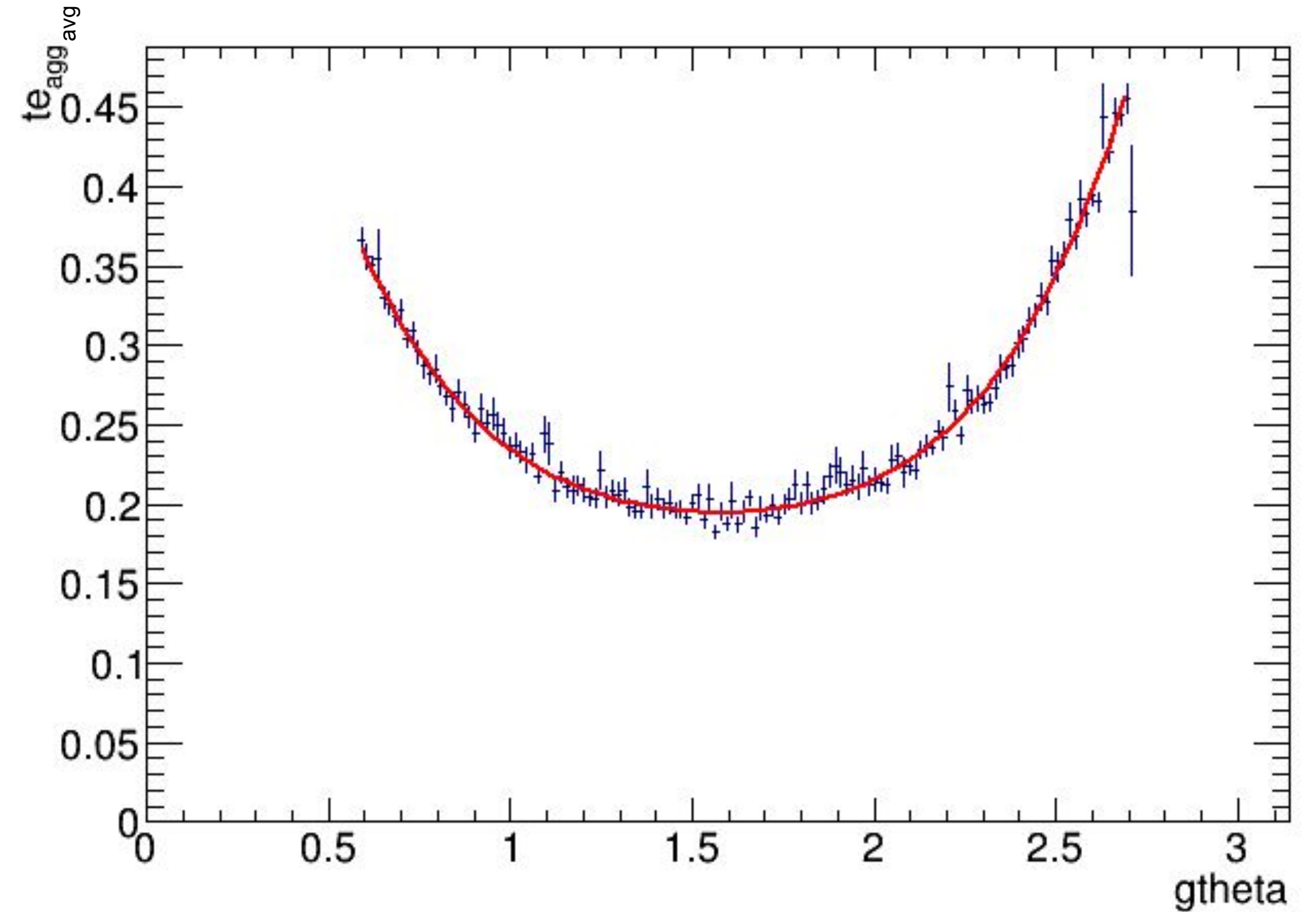
CEMC (μ^-)

Eta Cut: -1.5 to 1.2



NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	1.94845e-01	9.35383e-04	-0.00000e+00	-1.50770e-06
2	p1	4.94077e-04	2.17832e-03	-0.00000e+00	-4.58798e-05
3	p2	1.15078e-01	3.75753e-03	0.00000e+00	5.91976e-05
4	p3	-1.43306e-03	2.35790e-03	0.00000e+00	-2.72666e-04
5	p4	3.01639e-03	2.66675e-03	2.66675e-03	-1.11749e-04

reduced_chi2 of eta fit: 1.0485

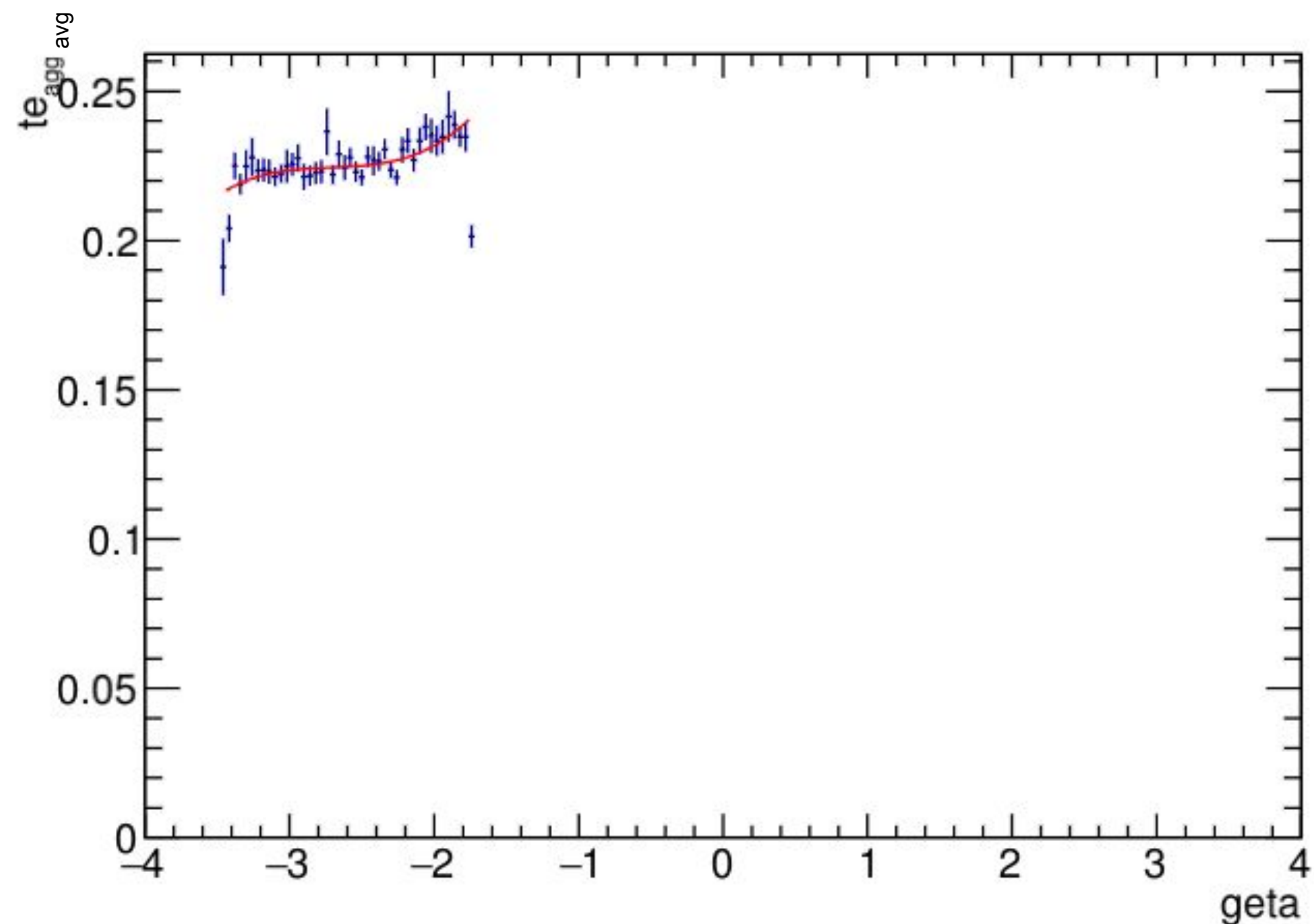


NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	9.46093e-01	2.68719e-03	-1.23162e-03	4.05204e-08
2	p1	-1.62771e+00	3.43564e-03	3.70185e-03	-5.93767e-07
3	p2	1.37776e+00	1.81743e-03	-3.83630e-03	1.14713e-05
4	p3	-5.49960e-01	8.68094e-04	1.64797e-03	2.56433e-05
5	p4	8.82673e-02	2.50538e-04	2.50538e-04	3.20234e-04

reduced_chi2 of theta fit: 1.03869

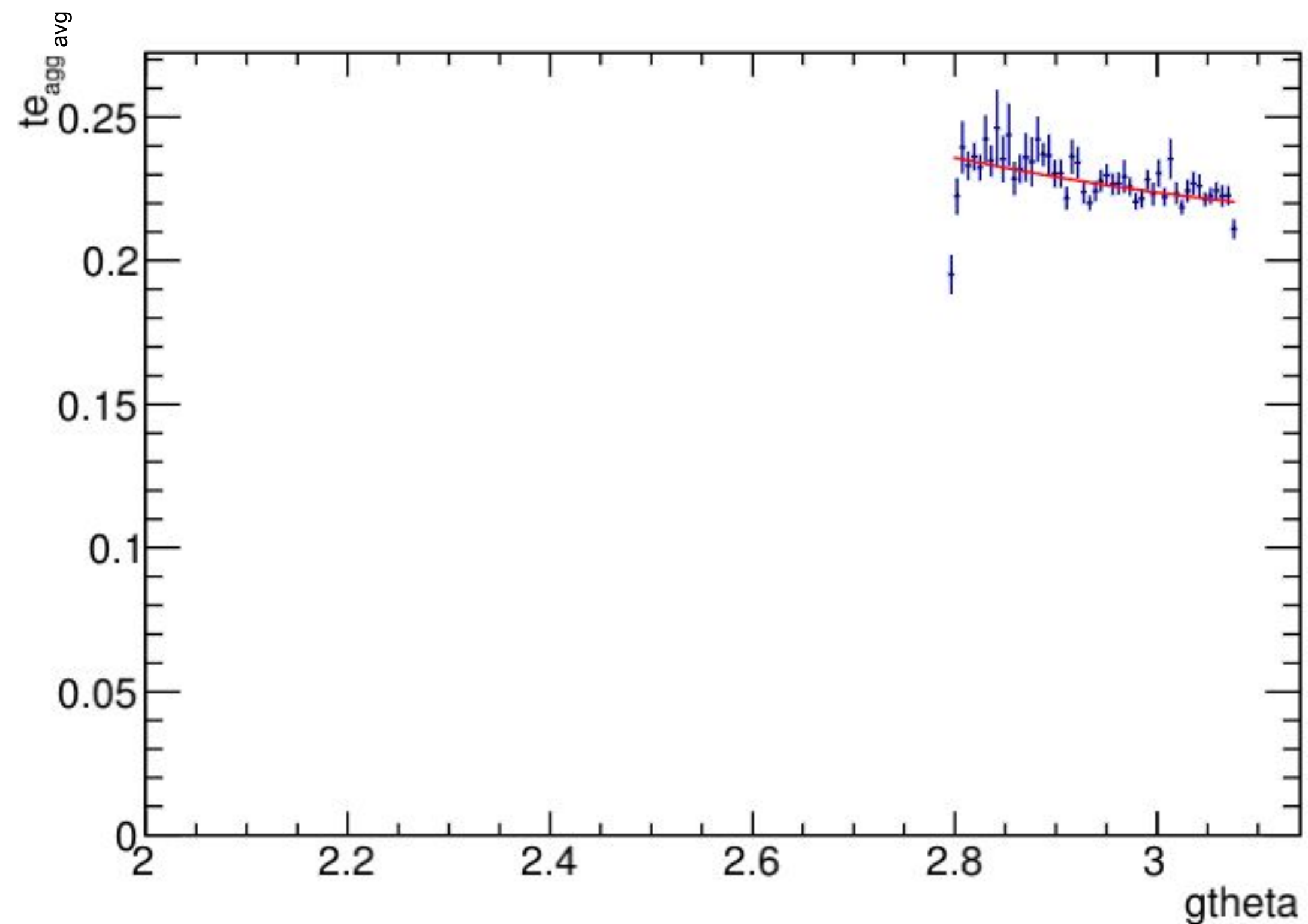
EEMC (μ^-)

Eta Cut: -3.45 to -1.75



NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	5.56017e-01	4.87876e-03	-4.09996e-03	4.95231e-07
2	p1	3.62613e-01	2.94412e-03	-4.94159e-03	-9.89388e-08
3	p2	1.32905e-01	1.05144e-03	-1.94485e-03	-6.34811e-07
4	p3	1.63264e-02	2.50126e-04	2.50126e-04	7.36492e-05

reduced_chi2 of eta fit: 1.08349

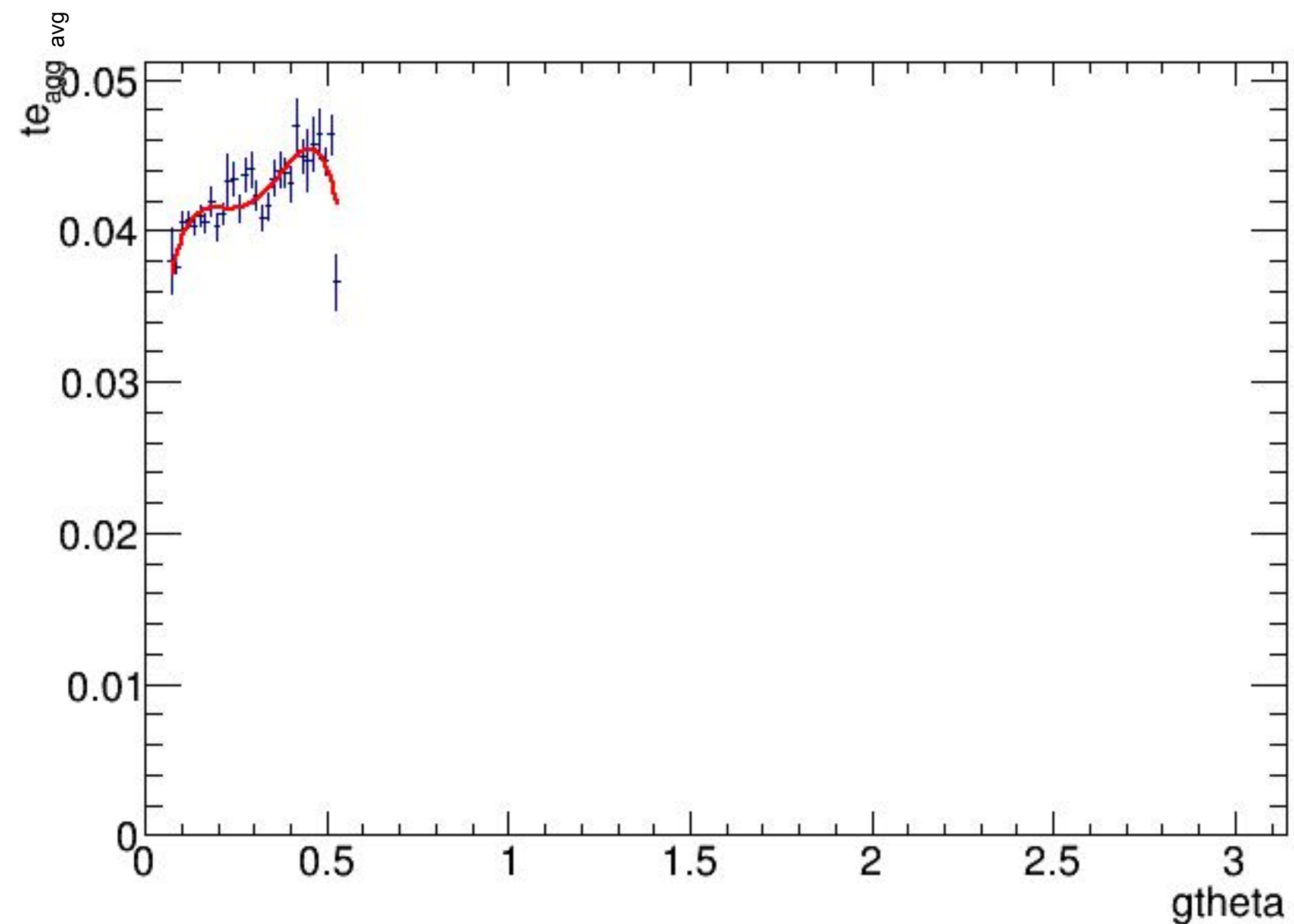
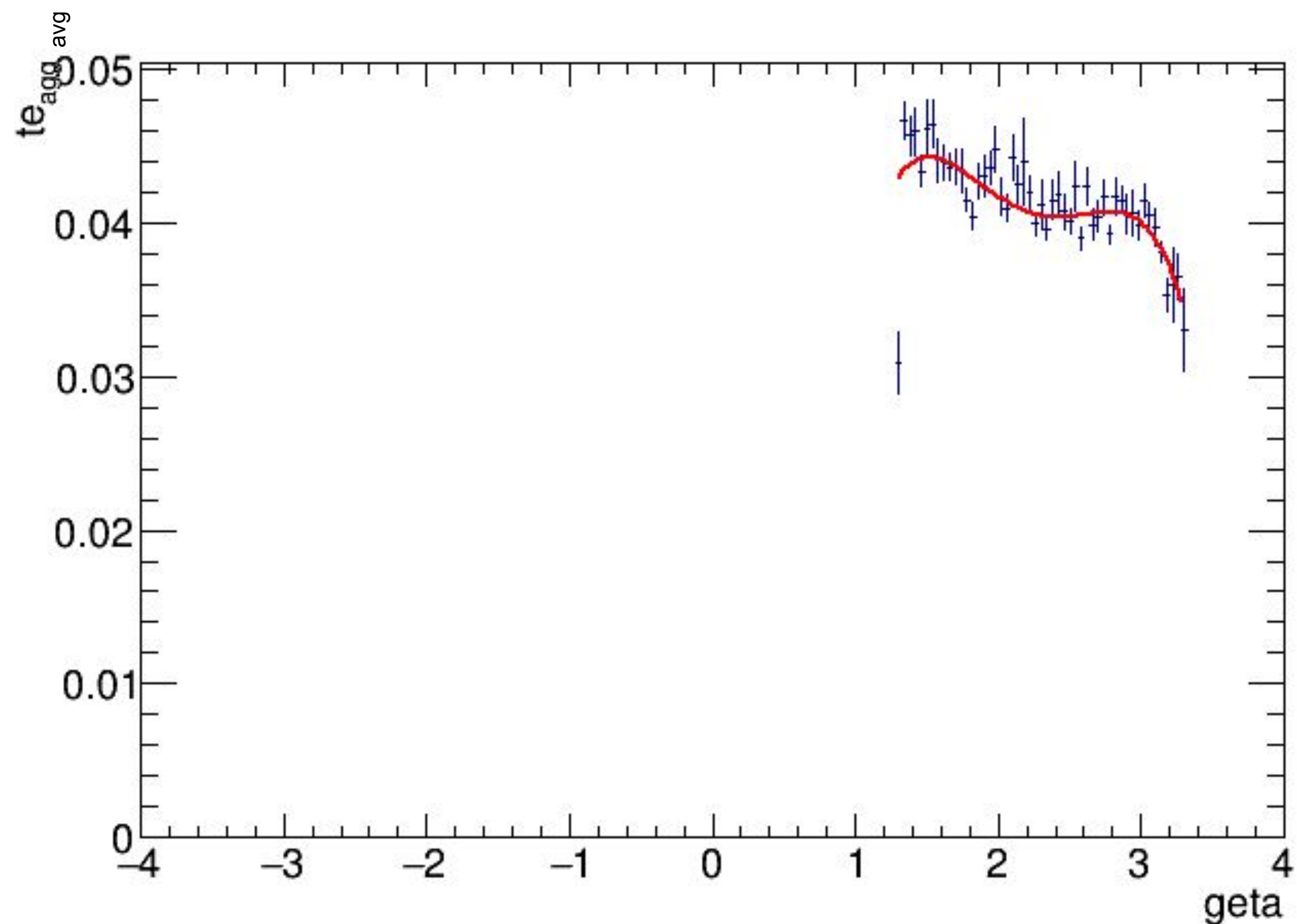


NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	6.25698e-01	6.87454e-03	-4.53905e-03	-5.84287e-02
2	p1	-1.07619e-01	2.63566e-03	7.96593e-04	3.40063e-01
3	p2	-4.63975e-02	8.84146e-04	1.02291e-03	-5.24916e-01
4	p3	1.25374e-02	2.61197e-04	2.61197e-04	1.90353e-02

reduced_chi2 of theta fit: 1.26952

FEMC (μ^-)

Eta Cut: 1.3 to 3.3



NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	-1.61086e-01	1.00105e-03	-5.86066e-04	-2.06399e-06
2	p1	4.05335e-01	7.15465e-04	1.11731e-03	1.60071e-05
3	p2	-2.89693e-01	2.76690e-04	-7.75249e-04	5.88547e-05
4	p3	8.86332e-02	1.00605e-04	2.32420e-04	-2.24953e-04
5	p4	-9.88635e-03	2.54603e-05	2.54603e-05	-4.67751e-02

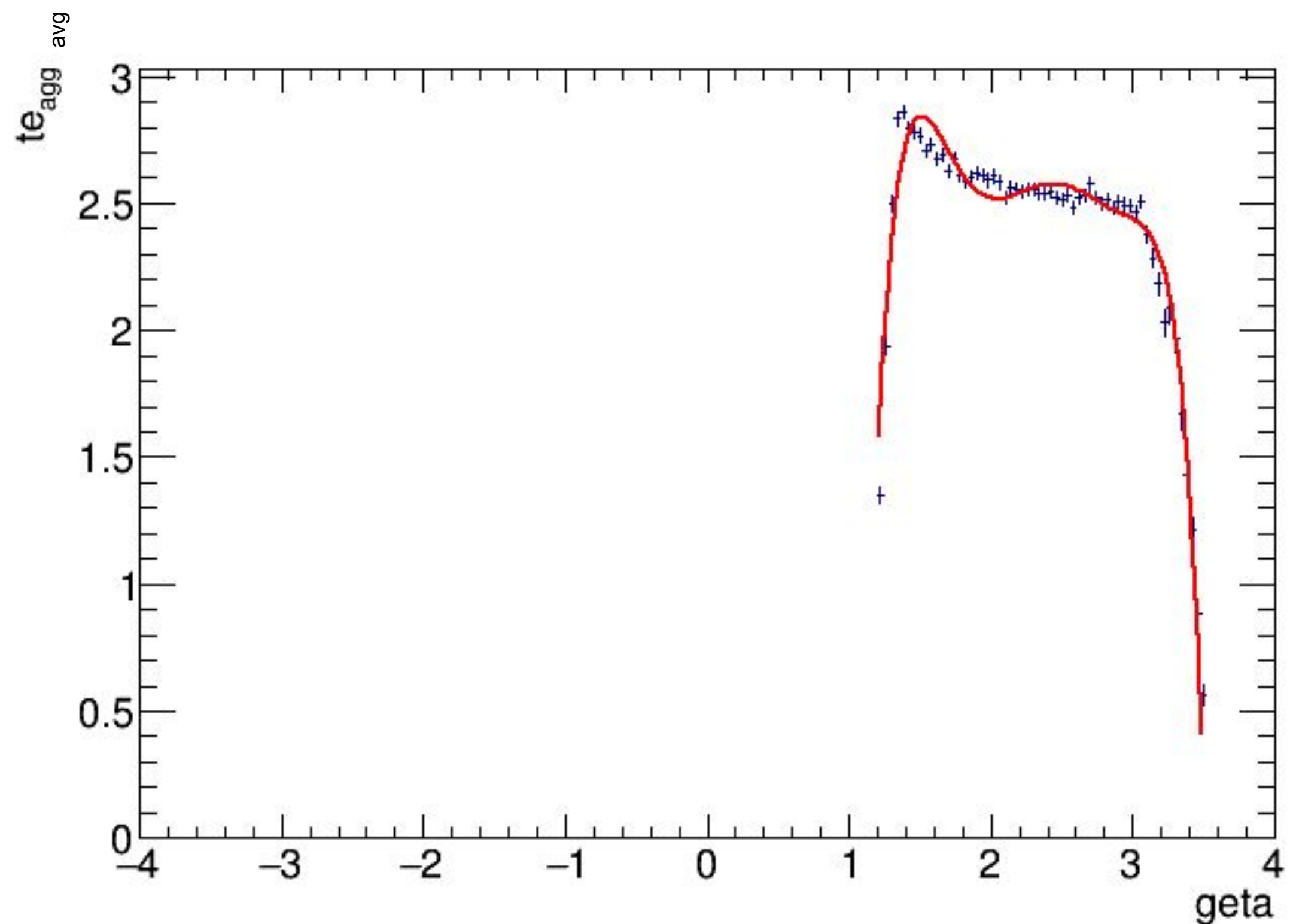
reduced_chi2 of eta fit: 2.47752

NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	2.25440e-02	3.86214e-03	1.18495e-04	6.34118e-05
2	p1	3.04425e-01	7.12010e-02	-2.30581e-03	8.57440e-05
3	p2	-1.76758e+00	4.39739e-01	1.47447e-02	2.82426e-05
4	p3	4.33297e+00	1.09537e+00	-3.73474e-02	6.11386e-06
5	p4	-3.68401e+00	9.42847e-01	9.42847e-01	9.04000e-08

reduced_chi2 of theta fit: 1.92696

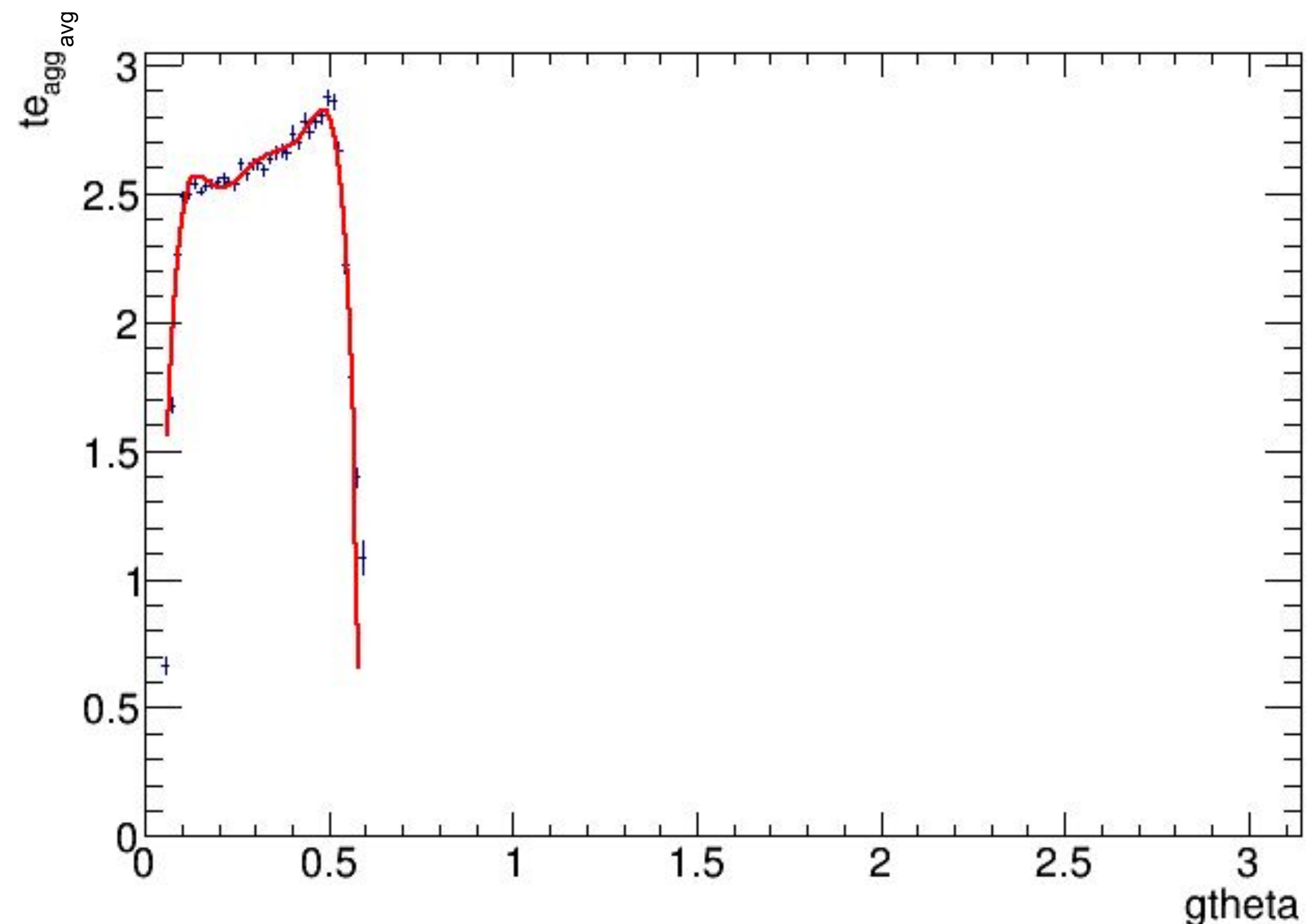
FHCAL (μ^-)

Eta Cut: 1.2 to 3.5



NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	-2.01204e+02	2.00598e-02	6.28117e-03	-3.00538e-04
2	p1	4.90828e+02	1.50820e-02	-1.05727e-02	-8.97923e-03
3	p2	-4.40832e+02	5.94847e-03	4.82741e-03	2.05060e-02
4	p3	1.62000e+02	2.19260e-03	1.68781e-04	-1.29269e-01
5	p4	-2.78697e-01	7.79123e-04	-9.83989e-05	-4.58228e-02
6	p5	-1.77501e+01	2.62934e-04	-3.98012e-04	-2.79192e-01
7	p6	4.97559e+00	8.13384e-05	1.74959e-04	-1.63367e+00
8	p7	-4.42024e-01	2.07645e-05	2.07645e-05	-1.14220e+02

reduced_chi2 of eta fit: 11.8783

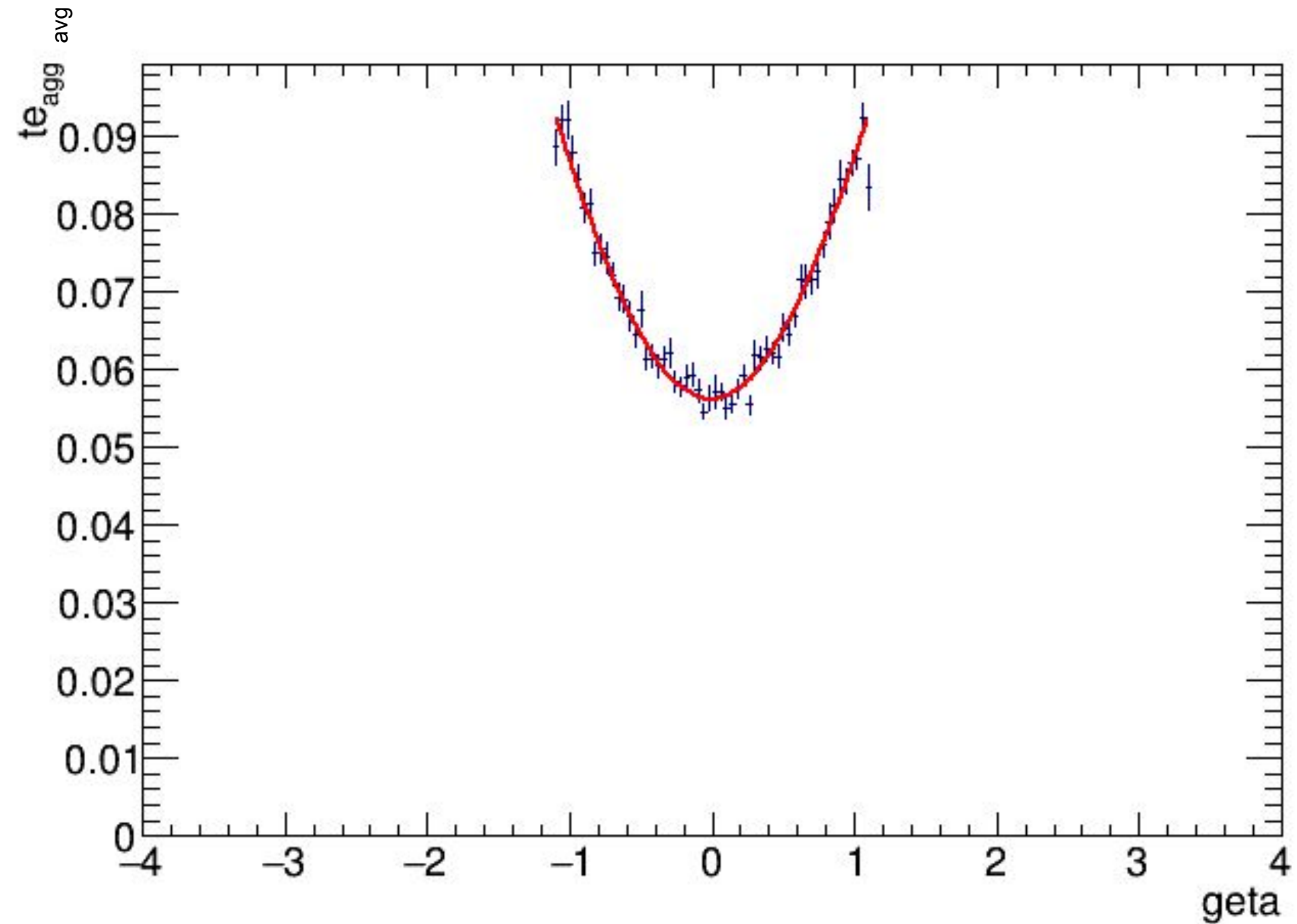


NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	-4.10705e+00	1.30951e-02	1.39923e-03	-2.27543e-02
2	p1	1.63743e+02	1.06640e-01	-2.48514e-02	7.07722e-03
3	p2	-1.58371e+03	3.07949e-01	1.04290e-01	1.32921e-02
4	p3	7.72251e+03	6.97712e-01	2.50922e-01	3.14667e-03
5	p4	-2.01324e+04	1.46555e+00	-2.60884e+00	4.64555e-03
6	p5	2.68089e+04	2.79511e+00	5.79107e+00	1.75175e-03
7	p6	-1.43261e+04	4.10811e+00	4.10811e+00	-9.25801e-06

reduced_chi2 of theta fit: 7.38491

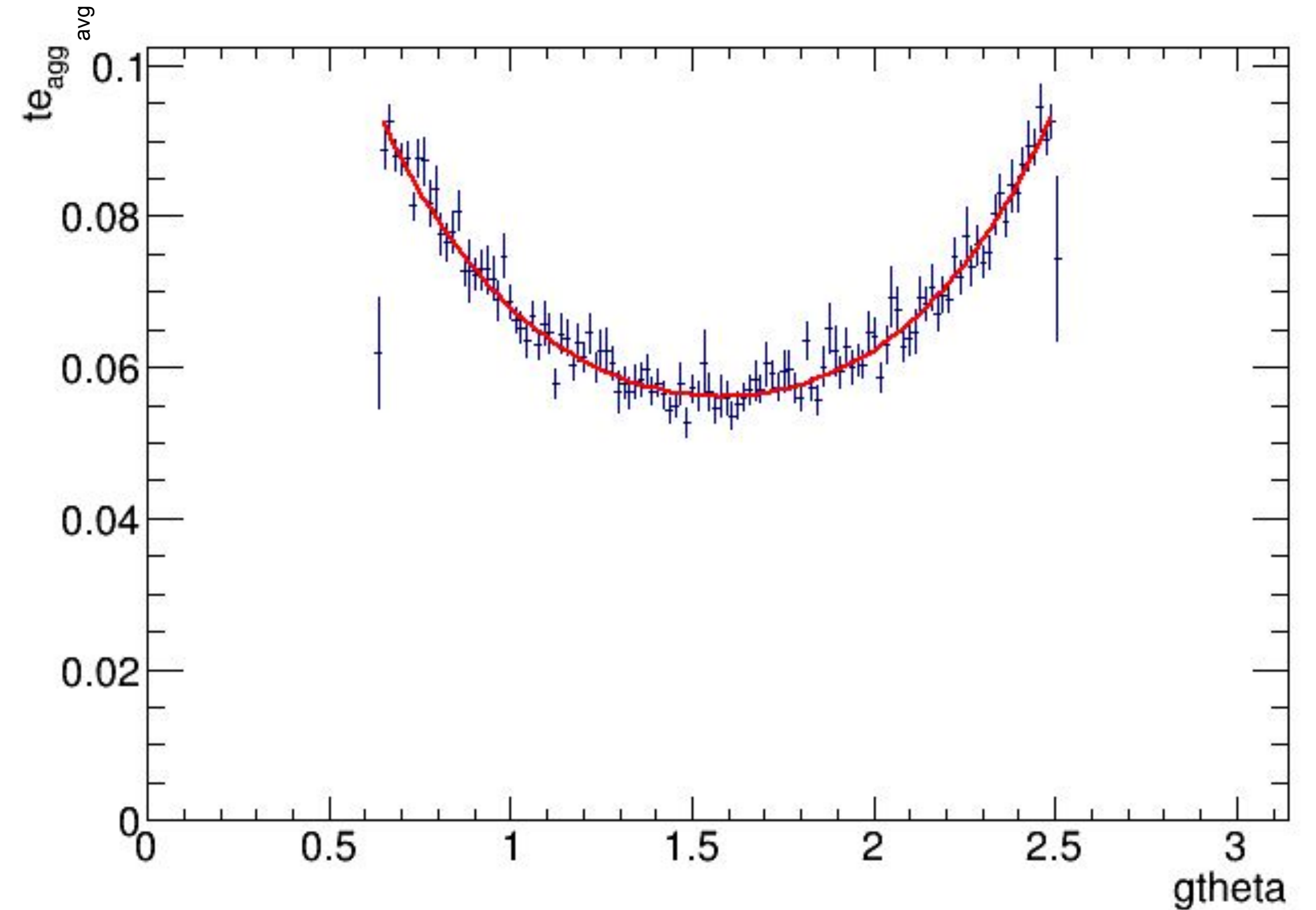
HCALIN (μ^-)

Eta Cut: -1.1 to 1.1



NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	5.61465e-02	3.41979e-04	2.95035e-10	8.41639e-04
2	p1	3.03267e-04	8.42357e-04	2.17219e-10	1.56243e-04
3	p2	3.47987e-02	2.06406e-03	-5.79626e-10	-2.50745e-04
4	p3	-4.31481e-04	1.09246e-03	-2.18127e-10	3.24973e-05
5	p4	-3.81682e-03	1.97473e-03	1.97473e-03	-3.65148e-09

reduced_chi2 of eta fit: 1.23514

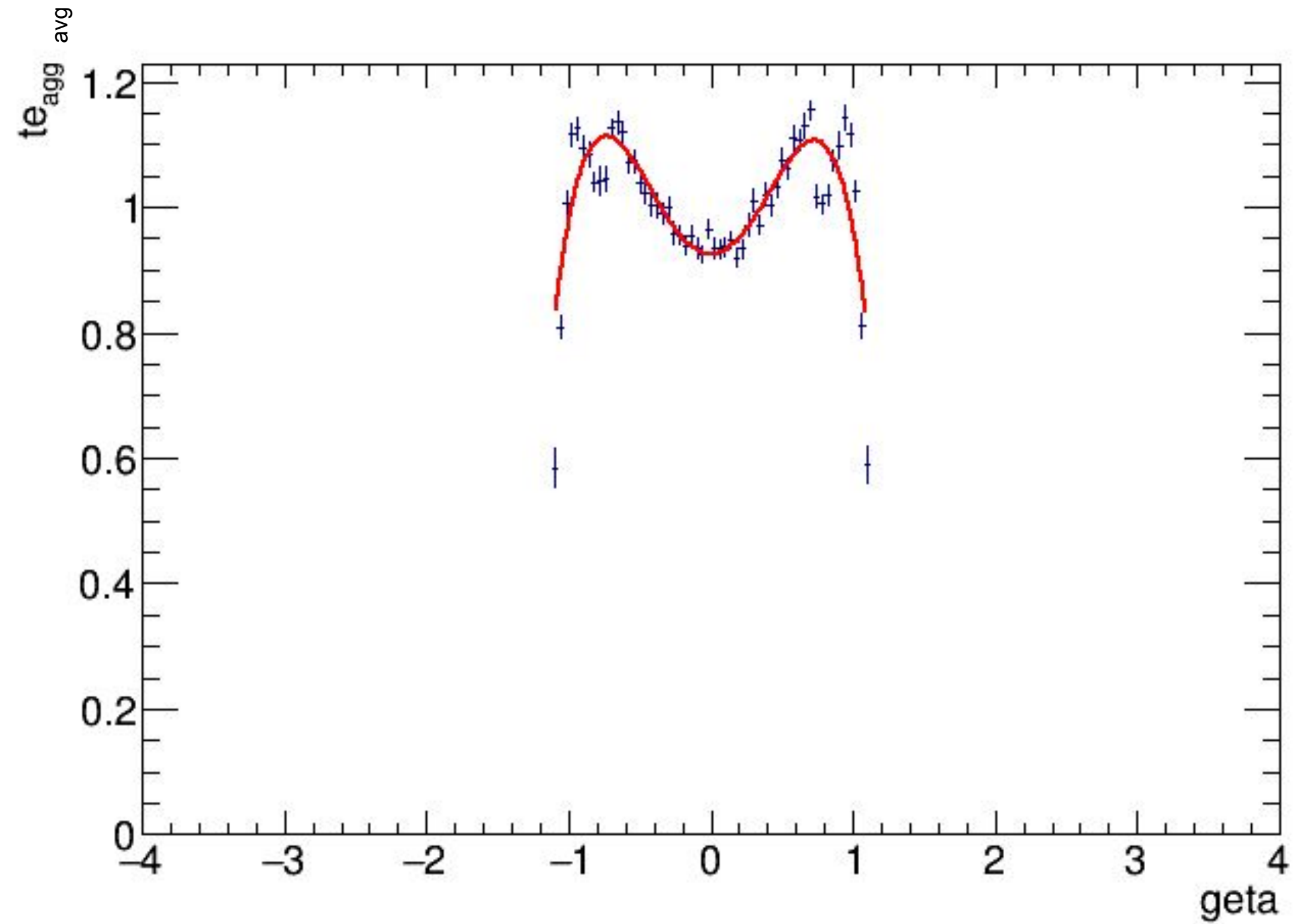


NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	2.15896e-01	1.03648e-03	-4.88401e-04	-1.20050e-06
2	p1	-3.09861e-01	1.31769e-03	1.48905e-03	1.02986e-06
3	p2	2.35645e-01	7.23488e-04	-1.58968e-03	-7.15912e-07
4	p3	-8.79206e-02	3.65872e-04	7.11033e-04	-1.75619e-05
5	p4	1.41715e-02	1.13378e-04	1.13378e-04	-1.09813e-01

reduced_chi2 of theta fit: 0.979428

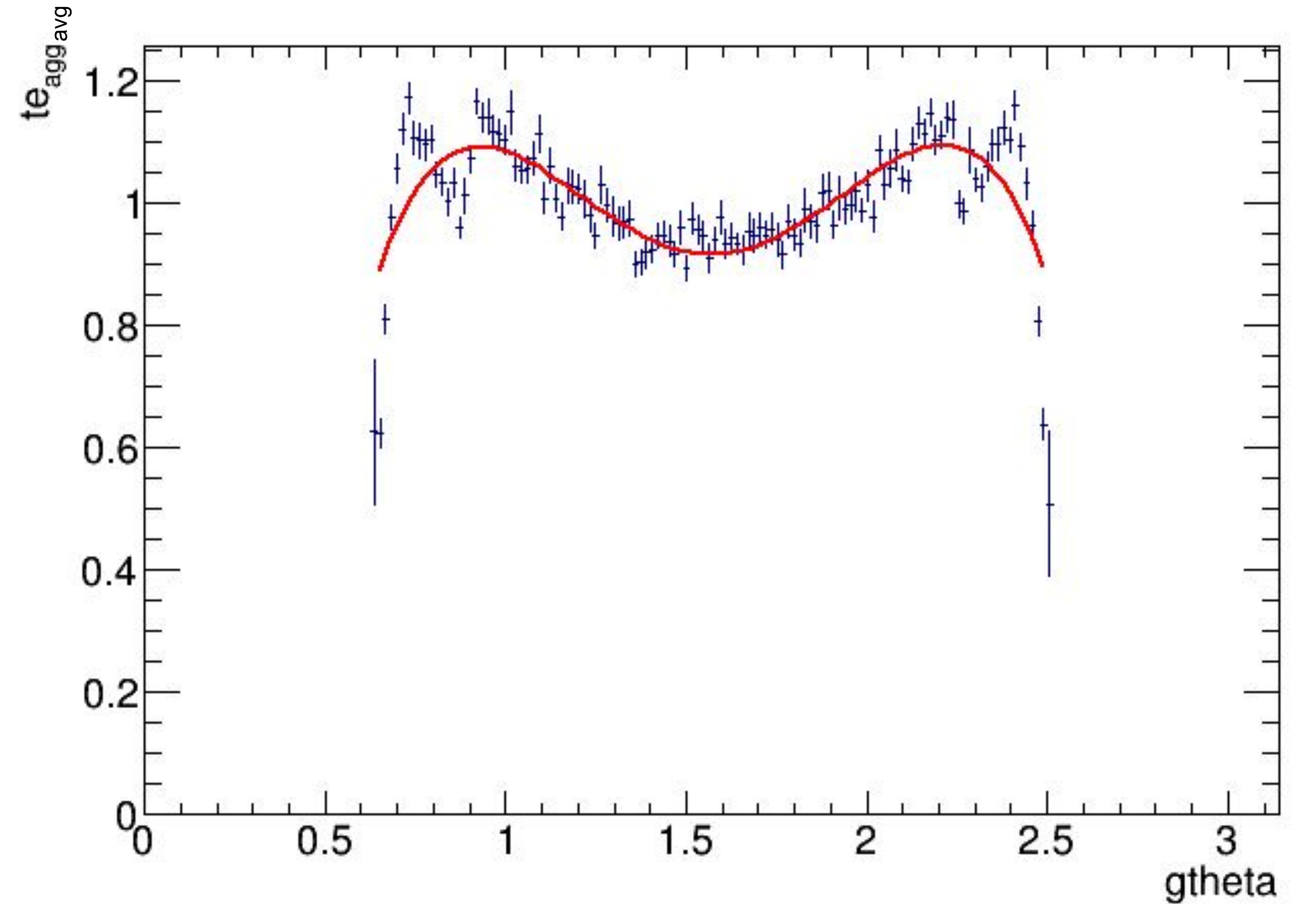
HCALOUT (μ^-)

Eta Cut: -1.1 to 1.1



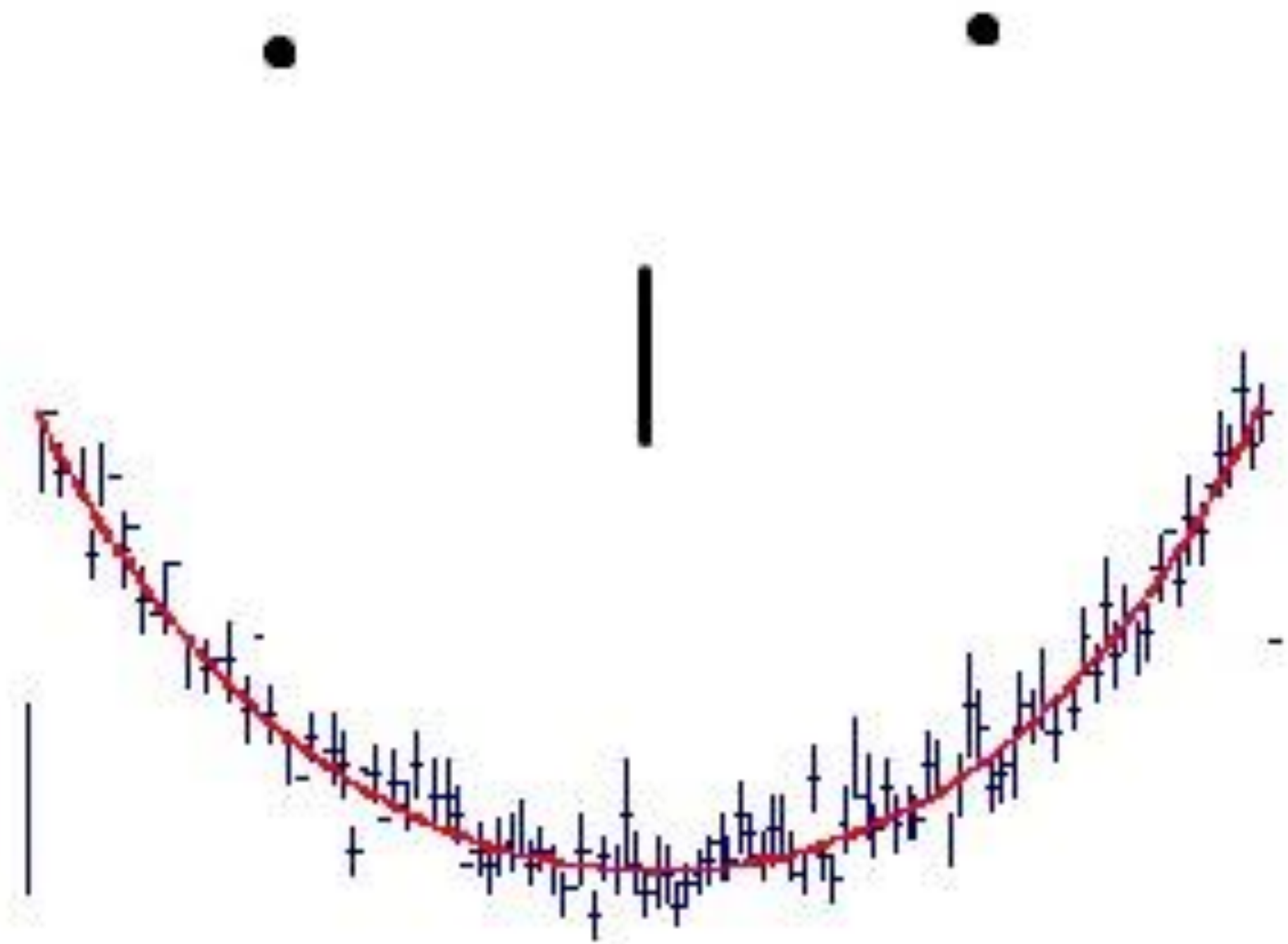
NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	9.23949e-01	3.87101e-03	0.00000e+00	-1.20116e-05
2	p1	-6.57468e-03	9.08443e-03	-0.00000e+00	1.65579e-04
3	p2	6.93335e-01	2.14625e-02	-0.00000e+00	1.11842e-04
4	p3	4.26311e-03	1.19213e-02	0.00000e+00	4.48531e-06
5	p4	-6.46965e-01	2.07269e-02	2.07269e-02	-5.93442e-09

reduced_chi2 of eta fit: 10.2463



NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	-3.39304e+00	1.09205e-02	-5.18801e-03	-9.43416e-09
2	p1	1.36763e+01	1.41721e-02	1.57610e-02	1.56185e-08
3	p2	-1.47758e+01	7.71153e-03	-1.67890e-02	4.75284e-07
4	p3	6.63220e+00	3.83492e-03	7.49426e-03	9.01673e-07
5	p4	-1.05462e+00	1.19280e-03	1.19280e-03	-3.93383e-05

reduced_chi2 of theta fit: 7.09831



That's all folks!