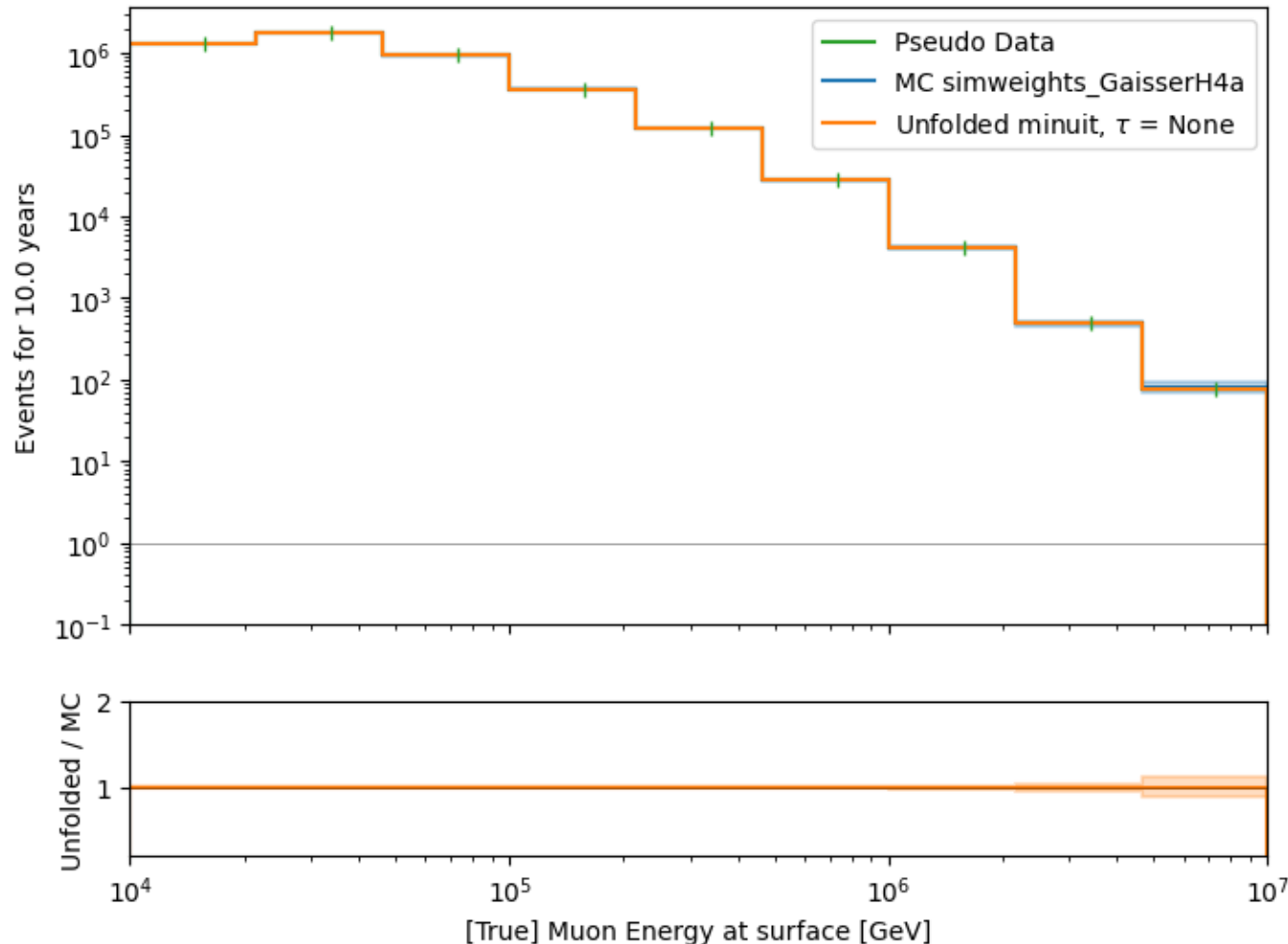


16.01.2025

Pascal

Fix unfolding bins, fit 4 systematics

$X0 = [\text{True values}, 1, 1, 1, 0.2]$



Scattering: 1.0198
Absorption: 1.0027
DOMEfficiency: 1.0054
HoleIce p0: 0.113

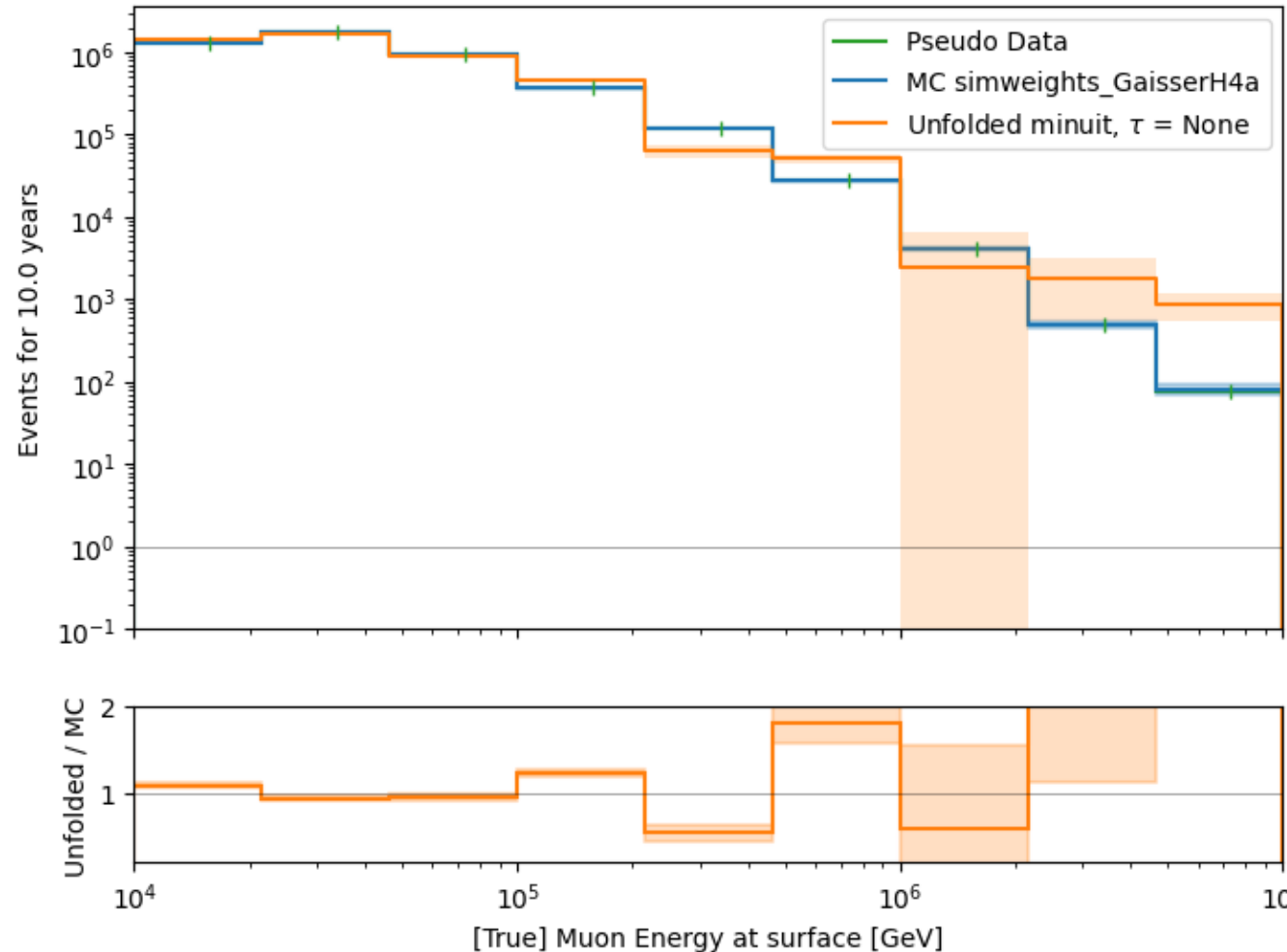
Hesse matrix

3.19e-06	-0.6e-6 (-0.340)	-1.4e-6 (-0.272)	-5.5e-6 (-0.193)
-0.6e-6 (-0.340)	8.96e-07	1.0e-6 (0.380)	5.0e-6 (0.326)
-1.4e-6 (-0.272)	1.0e-6 (0.380)	8.28e-06	37e-6 (0.802)
-5.5e-6 (-0.193)	5.0e-6 (0.326)	37e-6 (0.802)	0.000258

Valid Minimum	Below EDM threshold (goal x 10)
No parameters at limit	Below call limit
Hesse ok	Covariance accurate

Fit unfolding bins, fix 4 systematics

$X0 = [\text{True values}, \text{Fit systematics}]$



	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10
x0	3.16e+08	-0.73e9 (-0.921)	0.61e9 (0.691)	-0.26e9 (-0.437)	0.09e9 (0.272)	-0.03e9 (-0.163)	0 (0.031)	0.008e9 (0.108)	-3.2e6 (-0.138)	-0.46e6 (-0.077)	0.219e6 (0.097)
x1	-0.73e9 (-0.921)	1.98e+09	-2.0e9 (-0.908)	1.0e9 (0.693)	-0.4e9 (-0.489)	0.17e9 (0.318)	-0.03e9 (-0.096)	-0.029e9 (-0.162)	13.8e6 (0.239)	1.69e6 (0.113)	-0.951e6 (-0.168)
x2	0.61e9 (0.691)	-2.0e9 (-0.908)	2.46e+09	-1.5e9 (-0.913)	0.7e9 (0.722)	-0.29e9 (-0.499)	0.06e9 (0.192)	0.039e9 (0.194)	-21.2e6 (-0.329)	-2.22e6 (-0.133)	1.461e6 (0.231)
x3	-0.26e9 (-0.437)	1.0e9 (0.693)	-1.5e9 (-0.913)	1.16e+09	-0.6e9 (-0.909)	0.27e9 (0.680)	-0.07e9 (-0.318)	-0.025e9 (-0.177)	16.4e6 (0.372)	1.40e6 (0.123)	-1.138e6 (-0.262)
x4	0.09e9 (0.272)	-0.4e9 (-0.489)	0.7e9 (0.722)	-0.6e9 (-0.909)	3.71e+08	-0.20e9 (-0.889)	0.07e9 (0.519)	0.009e9 (0.109)	-9.4e6 (-0.376)	-0.70e6 (-0.108)	0.689e6 (0.281)
x5	-0.03e9 (-0.163)	0.17e9 (0.318)	-0.29e9 (-0.499)	0.27e9 (0.680)	-0.20e9 (-0.889)	1.4e+08	-0.06e9 (-0.778)	0.004e9 (0.088)	4.1e6 (0.265)	0.14e6 (0.034)	-0.348e6 (-0.230)
x6	0 (0.031)	-0.03e9 (-0.096)	0.06e9 (0.192)	-0.07e9 (-0.318)	0.07e9 (0.519)	-0.06e9 (-0.778)	4.29e+07	-0.017e9 (-0.655)	2.2e6 (0.254)	0.89e6 (0.403)	-0.136e6 (-0.163)
x7	0.008e9 (0.108)	-0.029e9 (-0.162)	0.039e9 (0.194)	-0.025e9 (-0.177)	0.009e9 (0.109)	0.004e9 (0.088)	-0.017e9 (-0.655)	1.66e+07	-4.4e6 (-0.841)	-1.07e6 (-0.781)	0.341e6 (0.657)
x8	-3.2e6 (-0.138)	13.8e6 (0.239)	-21.2e6 (-0.329)	16.4e6 (0.372)	-9.4e6 (-0.376)	4.1e6 (0.265)	2.2e6 (0.254)	-4.4e6 (-0.841)	1.68e+06	0.26e6 (0.589)	-0.130e6 (-0.787)
x9	-0.46e6 (-0.077)	1.69e6 (0.113)	-2.22e6 (-0.133)	1.40e6 (0.123)	-0.70e6 (-0.108)	0.14e6 (0.034)	0.89e6 (0.403)	-1.07e6 (-0.781)	0.26e6 (0.589)	1.13e+05	-0.028e6 (-0.649)
x10	0.219e6 (0.097)	-0.951e6 (-0.168)	1.461e6 (0.231)	-1.138e6 (-0.262)	0.689e6 (0.281)	-0.348e6 (-0.230)	-0.136e6 (-0.163)	0.341e6 (0.657)	-0.130e6 (-0.787)	-0.028e6 (-0.649)	1.62e+04

INVALID Minimum	ABOVE EDM threshold (goal x 10)
No parameters at limit	Below call limit
Hesse ok	Covariance accurate

Running m.migrad() a second time

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10
x0	3.16e+08 (-0.921)	-0.73e9 (-0.921)	0.61e9 (0.691)	-0.26e9 (-0.437)	0.09e9 (0.272)	-0.03e9 (-0.163)	0 (0.031)	0.008e9 (0.108)	-3.2e6 (-0.138)	-0.46e6 (-0.077)	0.219e6 (0.097)
x1	-0.73e9 (-0.921)	1.98e+09 (-0.908)	-2.0e9 (-0.908)	1.0e9 (0.693)	-0.4e9 (-0.489)	0.17e9 (0.318)	-0.03e9 (-0.096)	-0.029e9 (-0.162)	13.8e6 (0.239)	1.69e6 (0.113)	-0.951e6 (-0.168)
x2	0.61e9 (0.691)	-2.0e9 (-0.913)	2.46e+09 (-0.913)	-1.5e9 (-0.913)	0.7e9 (0.722)	-0.29e9 (-0.499)	0.06e9 (0.192)	0.039e9 (0.194)	-21.2e6 (-0.329)	-2.22e6 (-0.133)	1.461e6 (0.231)
x3	-0.26e9 (-0.437)	1.0e9 (0.693)	-1.5e9 (-0.913)	1.16e+09 (-0.909)	-0.6e9 (-0.909)	0.27e9 (0.680)	-0.07e9 (-0.318)	-0.025e9 (-0.177)	16.4e6 (0.372)	1.40e6 (0.123)	-1.138e6 (-0.262)
x4	0.09e9 (0.272)	-0.4e9 (-0.489)	0.7e9 (0.722)	-0.6e9 (-0.909)	3.71e+08 (-0.889)	-0.20e9 (-0.889)	0.07e9 (0.519)	0.009e9 (0.109)	-9.4e6 (-0.376)	-0.70e6 (-0.108)	0.689e6 (0.281)
x5	-0.03e9 (-0.163)	0.17e9 (0.318)	-0.29e9 (-0.499)	0.27e9 (0.680)	-0.20e9 (-0.889)	1.4e+08 (-0.889)	-0.06e9 (-0.778)	0.004e9 (0.088)	4.1e6 (0.265)	0.14e6 (0.034)	-0.348e6 (-0.230)
x6	0 (0.031)	-0.03e9 (-0.096)	0.06e9 (0.192)	-0.07e9 (-0.318)	0.07e9 (0.519)	-0.06e9 (-0.778)	4.29e+07 (-0.655)	-0.017e9 (-0.655)	2.2e6 (0.254)	0.89e6 (0.403)	-0.136e6 (-0.163)
x7	0.008e9 (0.108)	-0.029e9 (-0.162)	0.039e9 (0.194)	-0.025e9 (-0.177)	0.009e9 (0.109)	0.004e9 (0.088)	-0.017e9 (-0.655)	1.66e+07 (-0.655)	-4.4e6 (-0.841)	-1.07e6 (-0.781)	0.341e6 (0.657)
x8	-3.2e6 (-0.138)	13.8e6 (0.239)	-21.2e6 (-0.329)	16.4e6 (0.372)	-9.4e6 (-0.376)	4.1e6 (0.265)	2.2e6 (0.254)	-4.4e6 (-0.841)	1.68e+06 (0.589)	0.26e6 (0.589)	-0.130e6 (-0.787)
x9	-0.46e6 (-0.077)	1.69e6 (0.113)	-2.22e6 (-0.133)	1.40e6 (0.123)	-0.70e6 (-0.108)	0.14e6 (0.034)	0.89e6 (0.403)	-1.07e6 (-0.781)	0.26e6 (0.589)	1.13e+05 (-0.649)	-0.028e6 (-0.649)
x10	0.219e6 (0.097)	-0.951e6 (-0.168)	1.461e6 (0.231)	-1.138e6 (-0.262)	0.689e6 (0.281)	-0.348e6 (-0.230)	-0.136e6 (-0.163)	0.341e6 (0.657)	-0.130e6 (-0.787)	-0.028e6 (-0.649)	1.62e+04

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10
x0	1.06e+07 (-0.560)	-0.007e9 (-0.560)	-0.004e9 (-0.268)	-0 (-0.010)	0e6 (0.051)	0e6 (0.043)	0e6 (0.039)	-0.001e9 (-0.049)	0.3e6 (0.047)	0.05e6 (0.042)	-0.017e6 (-0.038)
x1	-0.007e9 (-0.560)	1.5e+07 (-0.560)	-0.005e9 (-0.335)	-0.002e9 (-0.147)	0e6 (0.026)	0e6 (0.013)	-0e6 (-0.000)	0 (0.003)	-0 (-0.006)	-0 (-0.003)	0.002e6 (0.004)
x2	-0.004e9 (-0.268)	-0.005e9 (-0.335)	1.62e+07 (-0.367)	-0.005e9 (-0.367)	-1e6 (-0.067)	-0e6 (-0.042)	-1e6 (-0.062)	0.001e9 (0.083)	-0.5e6 (-0.082)	-0.11e6 (-0.078)	0.035e6 (0.065)
x3	-0 (-0.010)	-0.002e9 (-0.147)	-0.005e9 (-0.367)	1.37e+07 (-0.423)	-4e6 (-0.423)	-2e6 (-0.157)	-1e6 (-0.120)	0.003e9 (0.165)	-0.9e6 (-0.148)	-0.21e6 (-0.156)	0.061e6 (0.123)
x4	0e6 (0.051)	0e6 (0.026)	-1e6 (-0.067)	-4e6 (-0.423)	7.35e+06 (-0.384)	-3e6 (-0.384)	-1e6 (-0.131)	1e6 (0.121)	-0.5e6 (-0.106)	-0.07e6 (-0.067)	0.025e6 (0.068)
x5	0e6 (0.043)	0e6 (0.013)	-0e6 (-0.042)	-2e6 (-0.157)	-3e6 (-0.384)	7.72e+06 (0.506)	3e6 (0.506)	-9e6 (-0.762)	3.3e6 (0.719)	0.70e6 (0.689)	-0.208e6 (-0.559)
x6	0e6 (0.039)	-0e6 (-0.000)	-1e6 (-0.062)	-1e6 (-0.120)	-1e6 (-0.131)	3e6 (0.506)	5.17e+06 (-0.883)	-9e6 (-0.883)	3.0e6 (0.797)	0.62e6 (0.747)	-0.183e6 (-0.600)
x7	-0.001e9 (-0.049)	0 (0.003)	0.001e9 (0.083)	0.003e9 (0.165)	1e6 (0.121)	-9e6 (-0.762)	-9e6 (-0.883)	1.87e+07 (-0.960)	-6.9e6 (-0.960)	-1.39e6 (-0.878)	0.432e6 (0.745)
x8	0.3e6 (0.047)	-0 (-0.006)	-0.5e6 (-0.082)	-0.9e6 (-0.148)	-0.5e6 (-0.106)	3.3e6 (0.719)	3.0e6 (0.797)	-6.9e6 (-0.960)	2.74e+06 (0.783)	0.47e6 (0.783)	-0.179e6 (-0.807)
x9	0.05e6 (0.042)	-0 (-0.003)	-0.11e6 (-0.078)	-0.21e6 (-0.156)	-0.07e6 (-0.067)	0.70e6 (0.689)	0.62e6 (0.747)	-1.39e6 (-0.878)	0.47e6 (0.783)	1.35e+05 (-0.715)	-0.035e6 (-0.715)
x10	-0.017e6 (-0.038)	0.002e6 (0.004)	0.035e6 (0.065)	0.061e6 (0.123)	0.025e6 (0.068)	-0.208e6 (-0.559)	-0.183e6 (-0.600)	0.432e6 (0.745)	-0.179e6 (-0.807)	-0.035e6 (-0.715)	1.8e+04

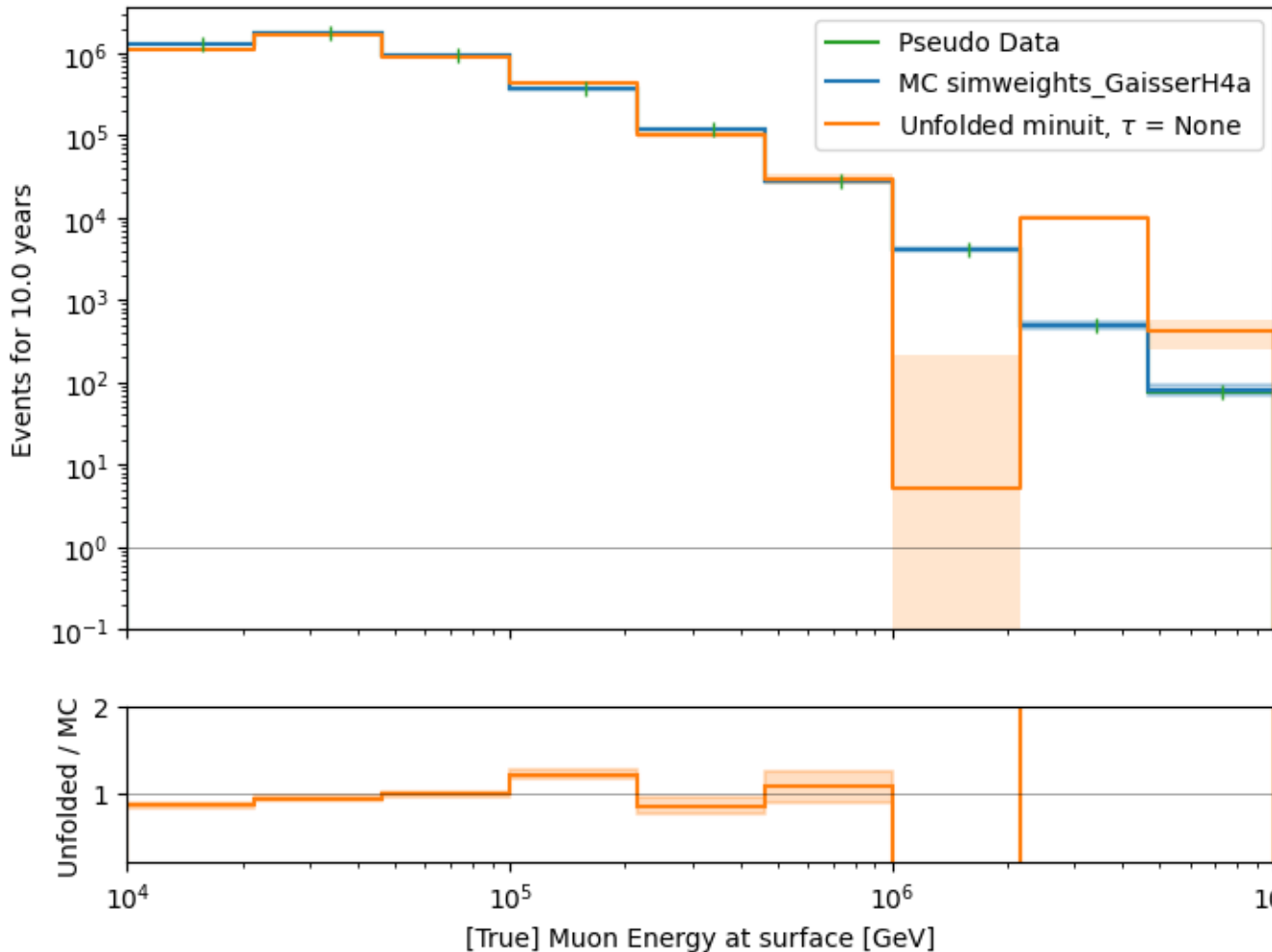
1 call

2 calls

- Actual fit values are basically the same

Fit all --> no overflow bounds

X0 = [True values, Fit systematics]

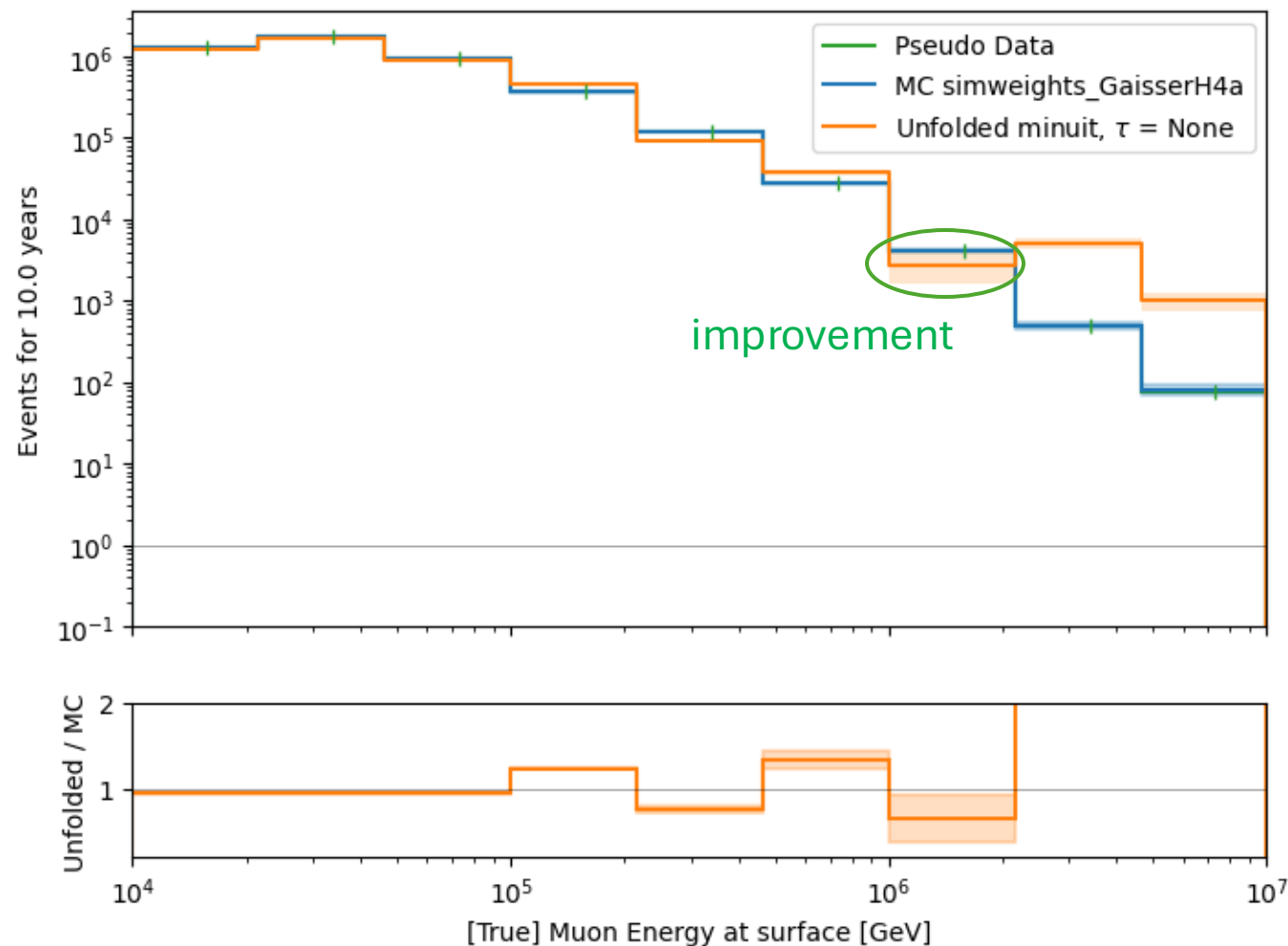


INVALID Minimum			ABOVE EDM threshold (goal x 10)					
SOME parameters at limit			Below call limit					
Hesse ok			Covariance accurate					
	Name	Value	Hesse Error	Minos Error-	Minos Error+	Limit-	Limit+	Fixed
0	x0	0.382e6	0.022e6			0	1E+07	
1	x1	1.13e6	0.05e6			0	1E+07	
2	x2	1.64e6	0.06e6			0	1E+07	
3	x3	0.92e6	0.04e6			0	1E+07	
4	x4	0.445e6	0.019e6			0	1E+07	
5	x5	0.102e6	0.011e6			0	1E+07	
6	x6	30e3	5e3			0	1E+07	
7	x7	0.01e3	0.21e3			0	1E+07	
8	x8	10.1e3	0.8e3			0	1E+07	
9	x9	0.41e3	0.17e3			0	1E+07	
10	x10	0.5	2.1			0	1E+07	
11	x11	1.0592	0.0027			0.913	1.09	
12	x12	1.0190	0.0011			0.913	1.09	
13	x13	0.9854	0.0035			0.9	1.1	
14	x14	-0.017	0.020			-0.1	0.5	

Overflow bin is at limit → add 2. overflow bin?

Fit all

X0 = [True values, Fit systematics]



INVALID Minimum		ABOVE EDM threshold (goal x 10)	
No parameters at limit		Below call limit	
Hesse ok		Covariance FORCED pos. def.	

	Name	Value	Hesse Error	Minos Error-	Minos Error+	Limit-	Limit+	Fixed
0	x0	0.286e6	0.017e6			0	1E+07	
1	x1	1.24e6	0.02e6			0	1E+07	
2	x2	1.663e6	0.009e6			0	1E+07	
3	x3	880e3	7e3			0	1E+07	
4	x4	452e3	6e3			0	1E+07	
5	x5	91e3	4e3			0	1E+07	
6	x6	37.4e3	3.2e3			0	1E+07	
7	x7	2.8e3	1.2e3			0	1E+07	
8	x8	5.2e3	0.8e3			0	1E+07	
9	x9	1.01e3	0.26e3			0	1E+07	
10	x10	0	80				1E+07	
11	x11	1.0474	0.0028			0.913	1.09	
12	x12	1.0160	0.0013			0.913	1.09	
13	x13	1.002	0.004			0.9	1.1	
14	x14	0.079	0.017			-0.1	0.5	