ATTENUATION MEASUREMENTS: SERIES 4 SUMMARY

Johnny Goett

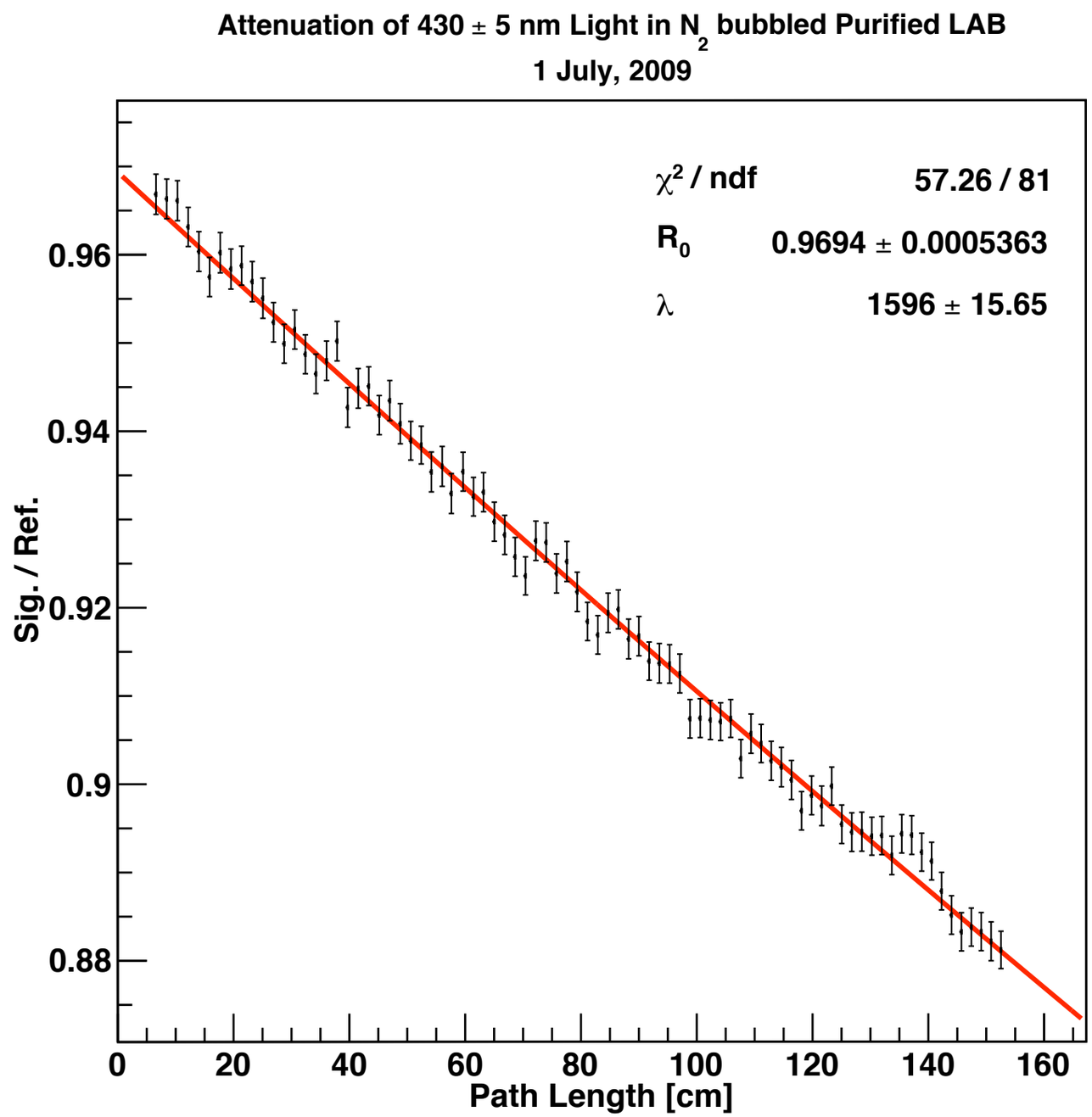
Thursday 13 August, 2009

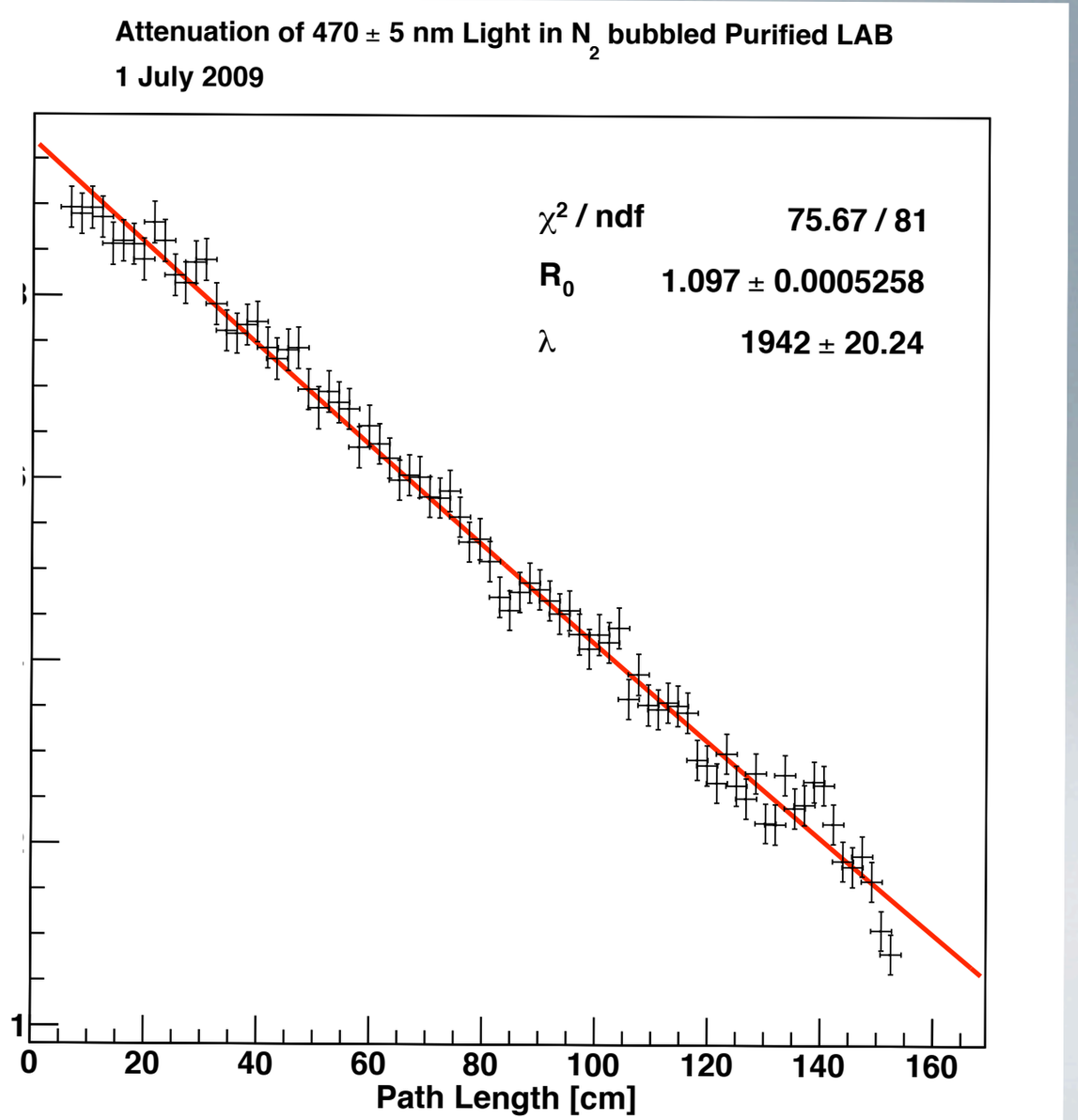
PLAB Sample #2 History:

Date	405 nm	430 nm	470 nm
6 March 2009	614.6 ± 2.7	X	2863 ± 51.7
	560.5 ± 2.1	X	2305 ± 32.9
24 March	603.8 ± 2.9	X	2301 ± 35.9
	603.8 ± 2.8	X	2236 ± 34.0
25 March	611.1 ± 2.9	X	2568 ± 43.8
20 June	X	1474 ± 15	2110 ± 36
21 June	X	1565 ± 22	2065 ± 35
1 July	X	1596 ± 15.7	1942 ± 20.2
2 July	X	1607 ± 17.6	2012 ± 24.4

N2 bubbled

No Bandpass


Attenuation of 430 ± 5 nm Light in N2 bubbled Purified LAB
1 July, 2009
χ2 / ndf 57.26 / 81
R0 0.9694 ± 0.0005363
λ 1596 ± 15.65
Sig. / Ref.
0.96
0.94
0.92
0.9
0.88
0
20
40
60
80
100
120
140
160
Path Length [cm]

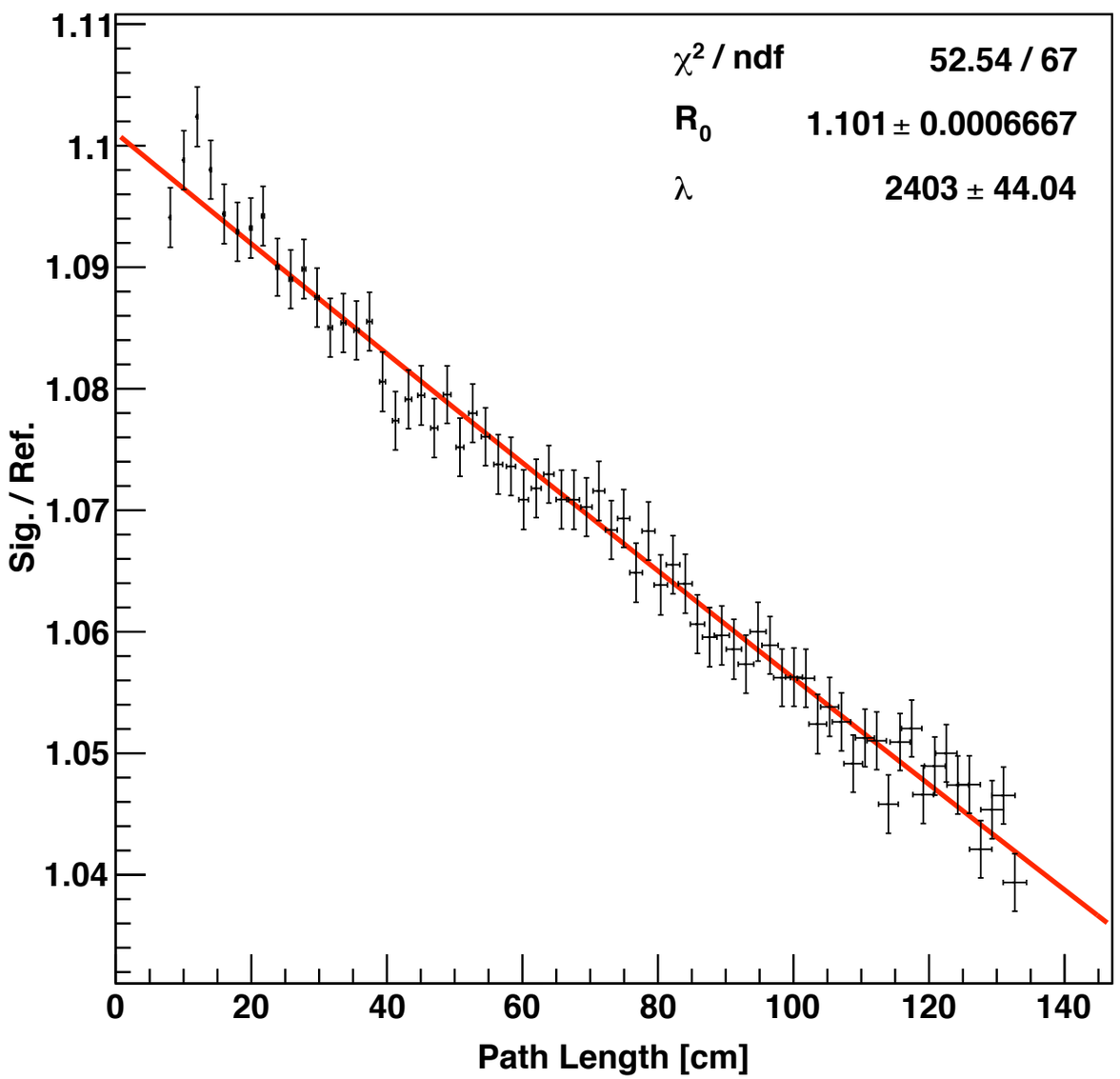

Attenuation of 470 ± 5 nm Light in N2 bubbled Purified LAB
1 July 2009
χ2 / ndf 75.67 / 81
R0 1.097 ± 0.0005258
λ 1942 ± 20.24
1
0
20
40
60
80
100
120
140
160
Path Length [cm]

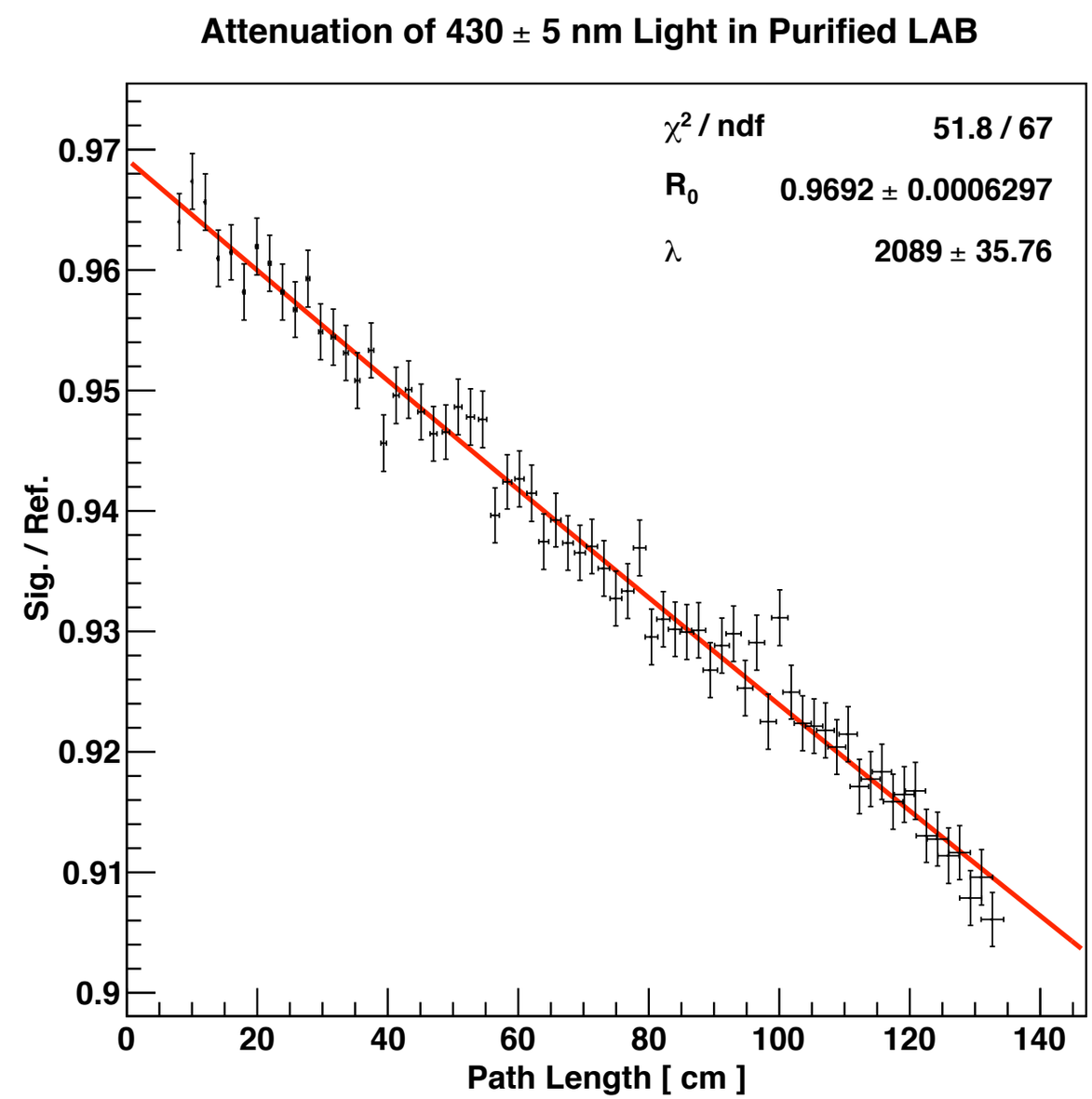
PURIFIED LAB SAMPLE #3

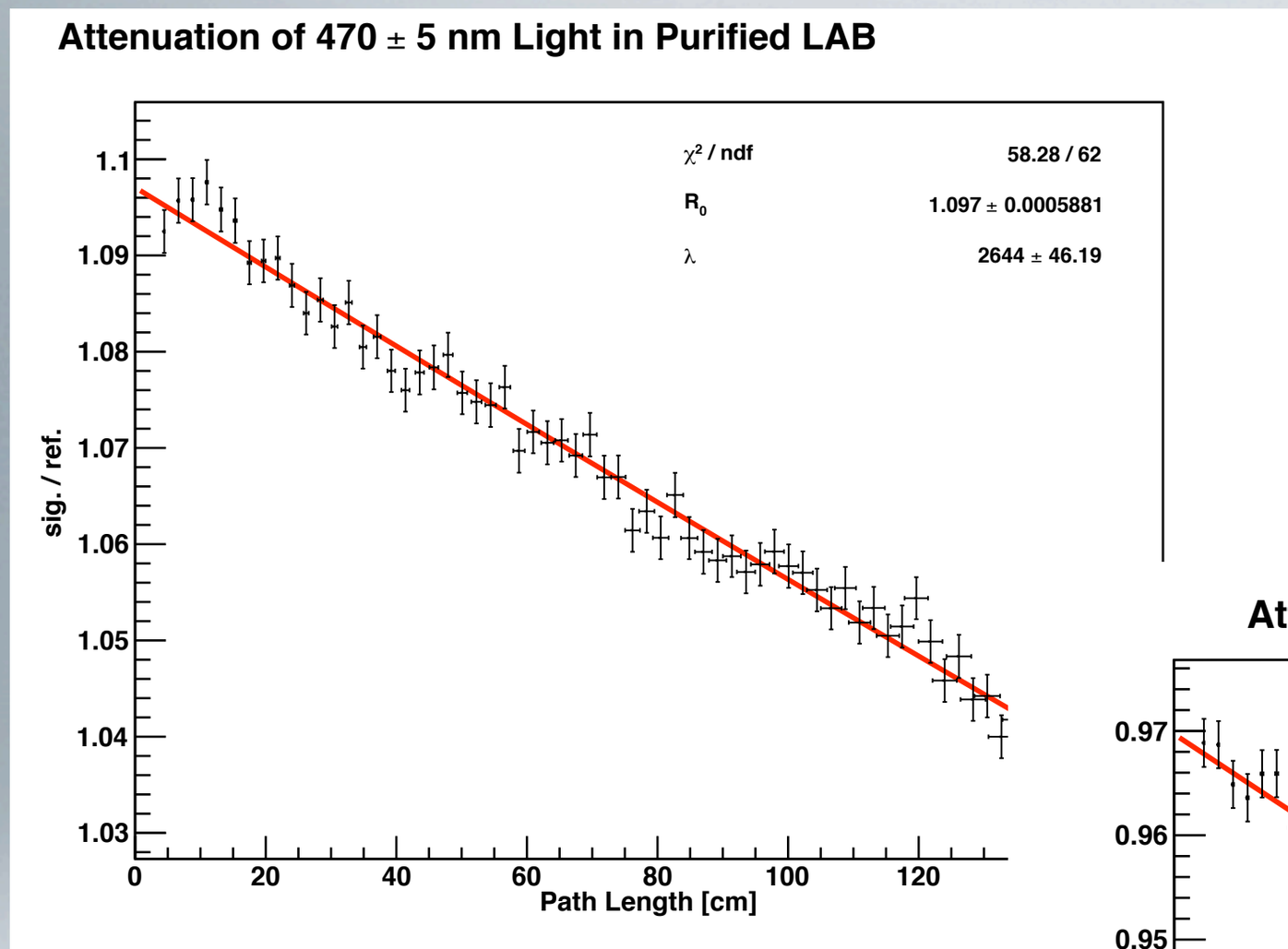
- Prepared by Sunej Hans on 6/05/2009
- Petresa LAB from same 60 gallon barrel as sample #2
- UV absorption @ 430 nm = .005, λ = 868 cm at production, Sample 2 (Landia) was at .004

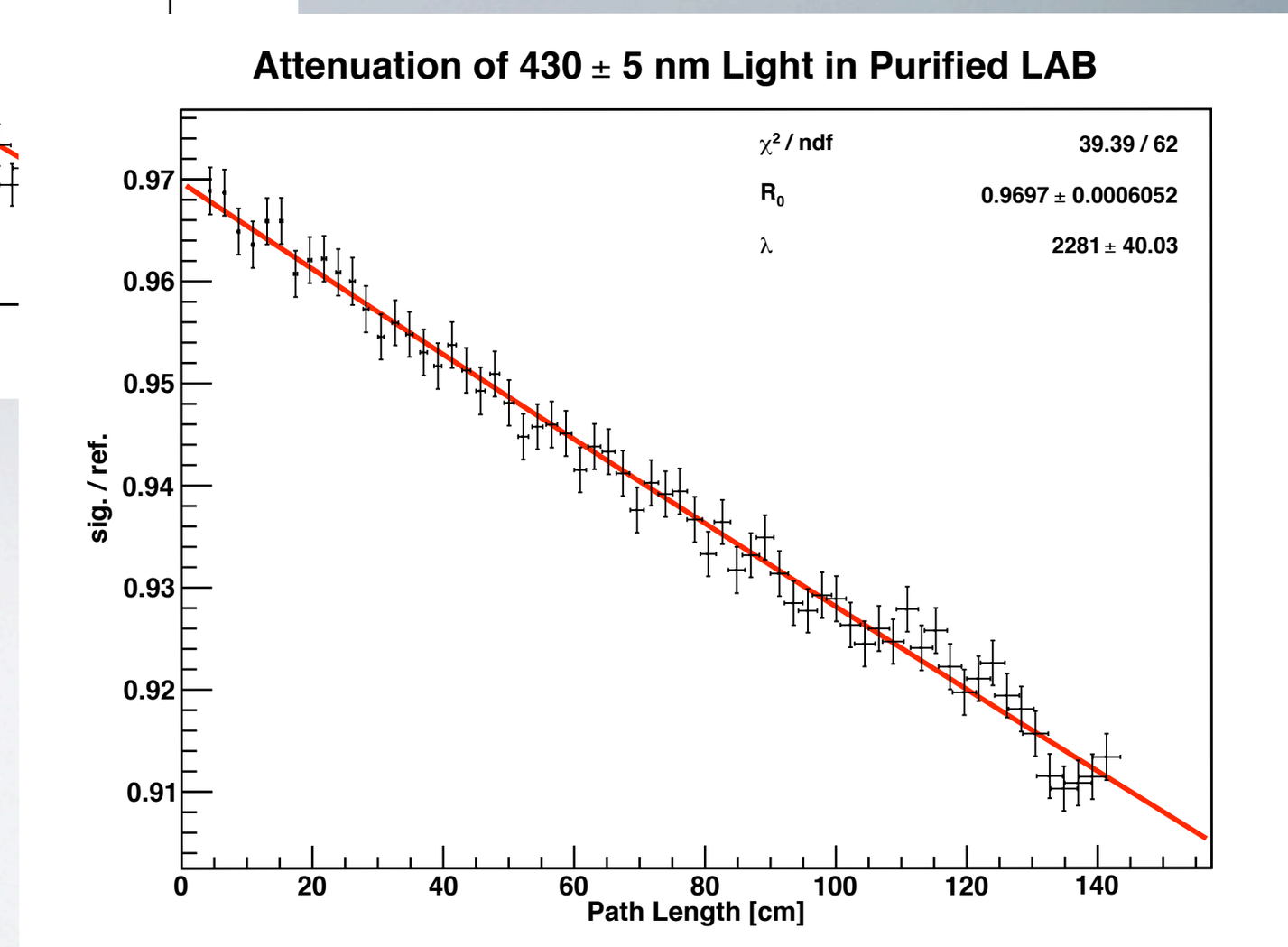
Sample Summary:

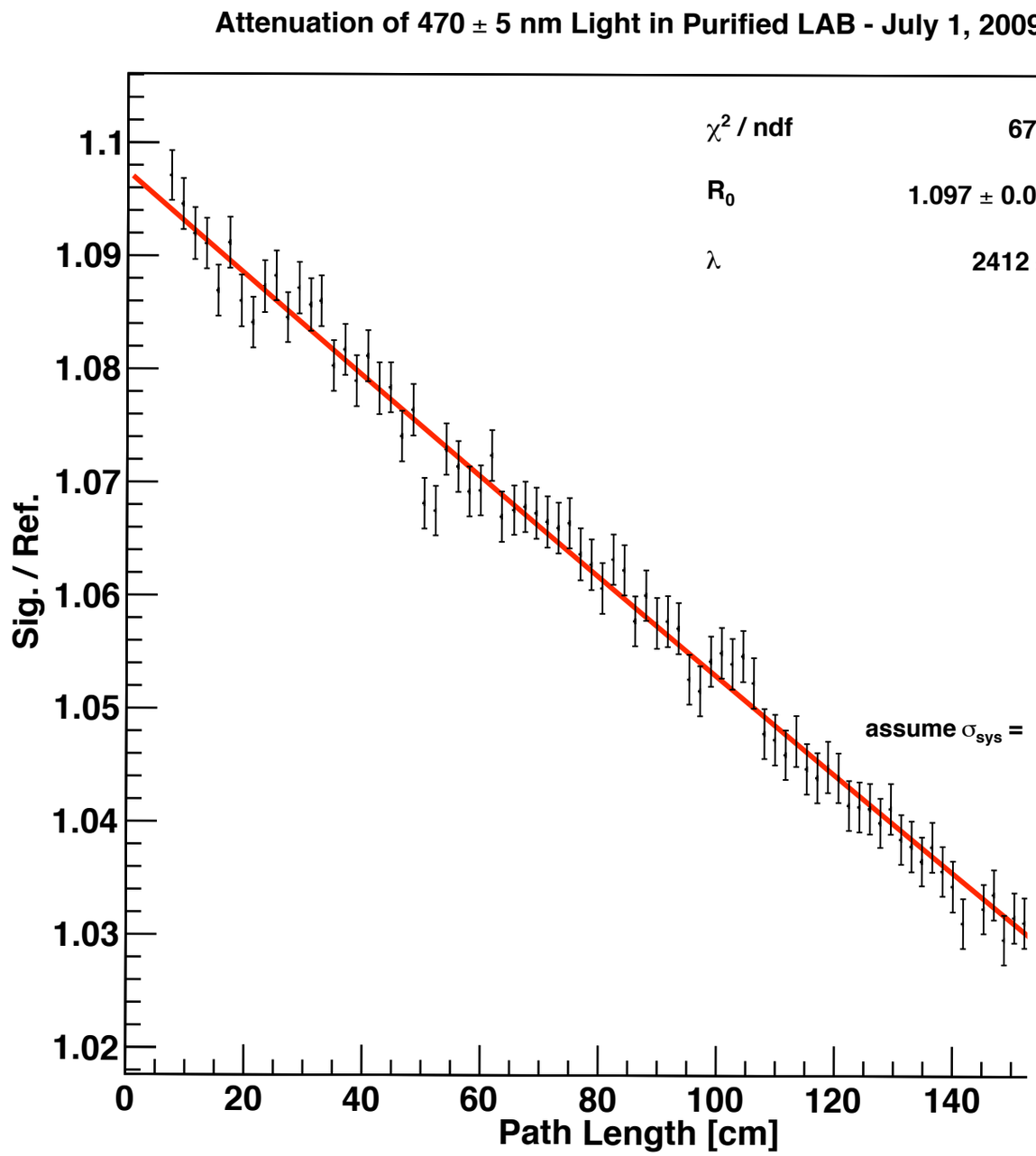
Date	405 nm	430 nm	470 nm
29 June 2009	X	2200 ± 31.8	2464 ± 42.3
30 June 2009	X	2089 ± 35.7	2403 ± 44.0
		+10% !?!	
	X	2281 ± 37.4	2644 ± 52.1
1 July 2009	X	2209 ± 27.8	2412 ± 30.6

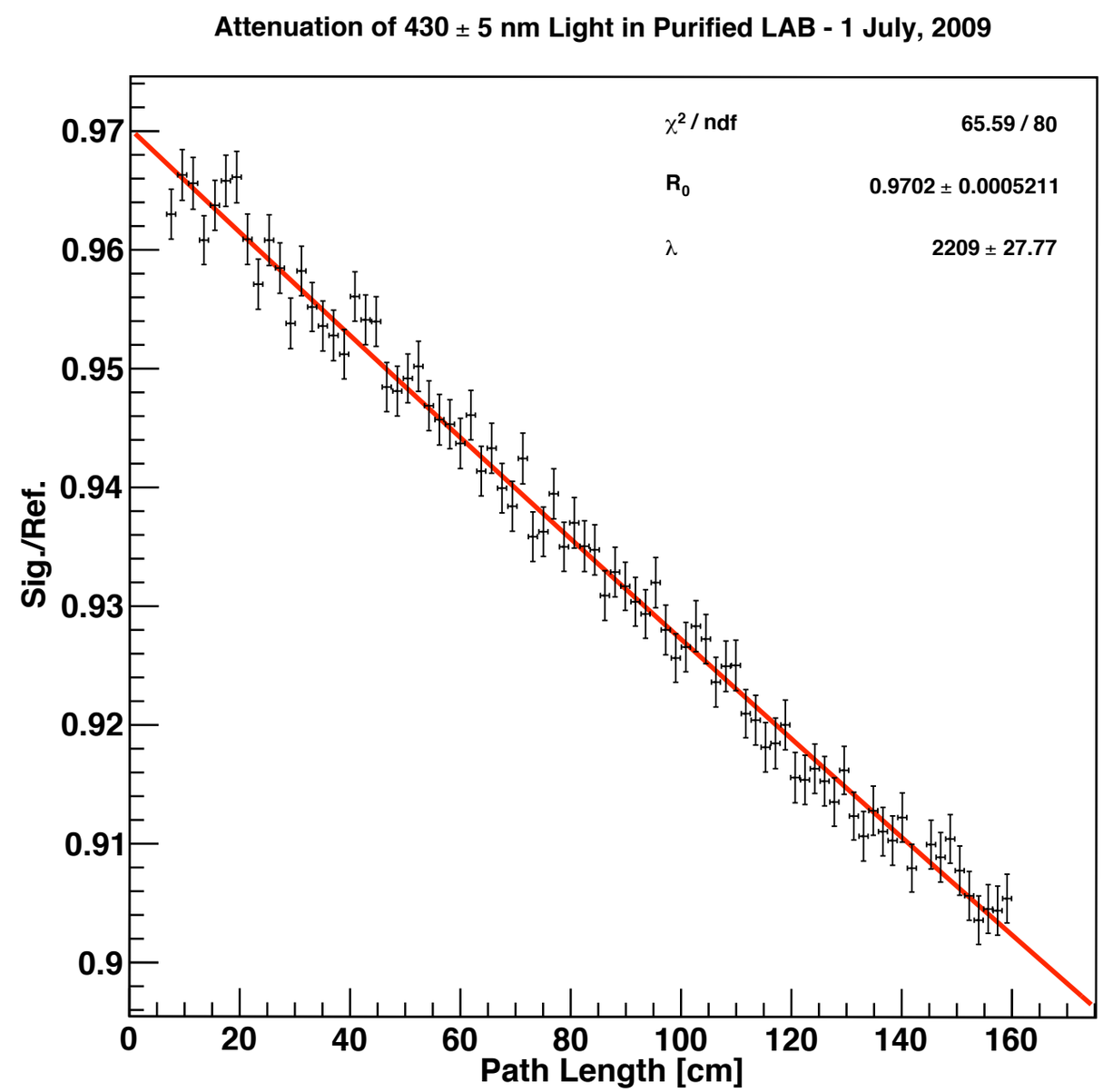

Attenuation of 470 ± 5 nm Light in Purified LAB
χ² / ndf 52.54 / 67
R0 1.101 ± 0.0006667
λ 2403 ± 44.04
Sig. / Ref.
Path Length [cm]


Attenuation of 430 ± 5 nm Light in Purified LAB
χ² / ndf 51.8 / 67
R0 0.9692 ± 0.0006297
λ 2089 ± 35.76
Sig. / Ref.
Path Length [cm]


Attenuation of 470 ± 5 nm Light in Purified LAB
χ² / ndf 58.28 / 62
R0 1.097 ± 0.0005881
λ 2644 ± 46.19
sig. / ref.
Path Length [cm]

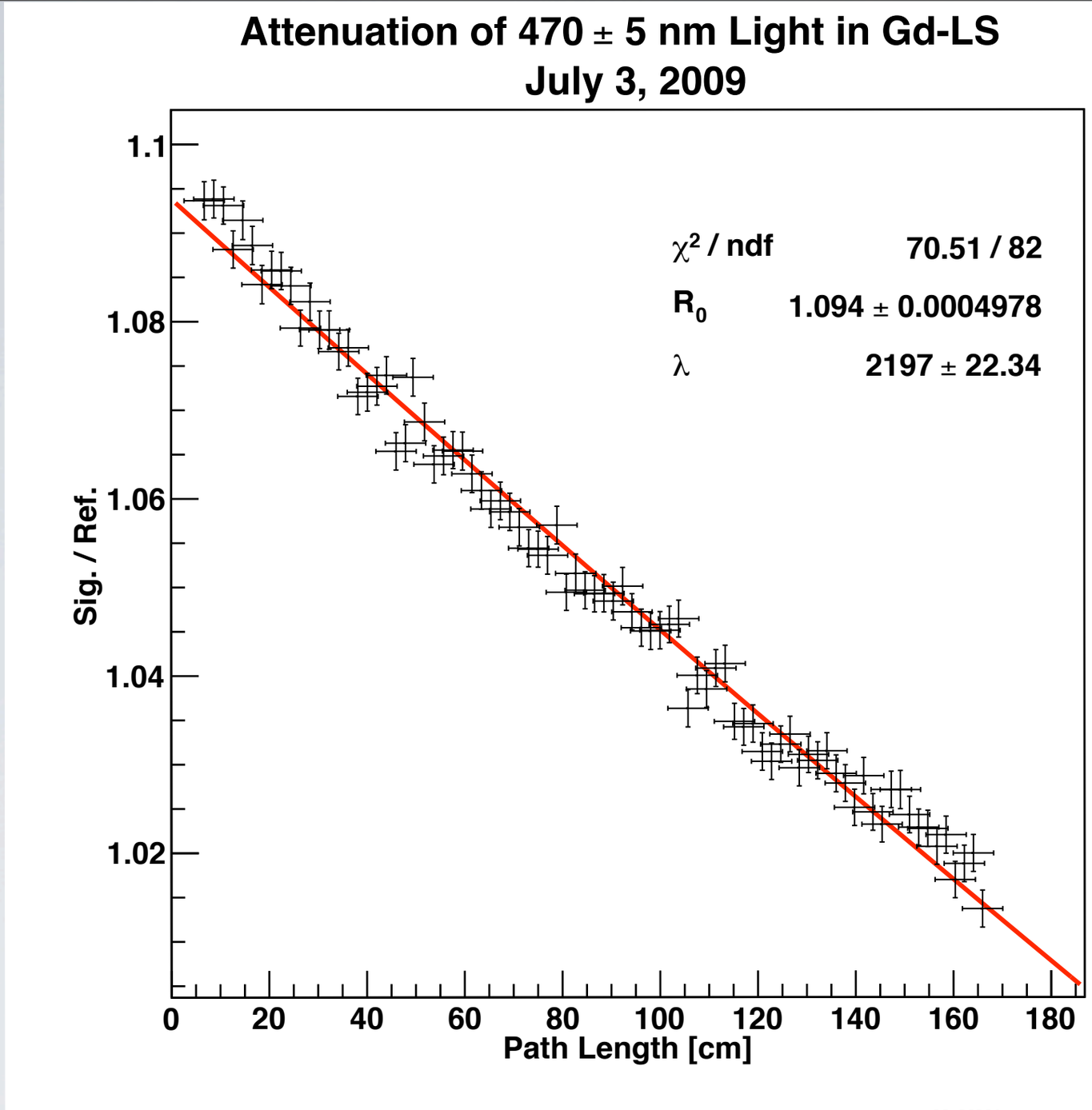

Attenuation of 430 ± 5 nm Light in Purified LAB
χ² / ndf 39.39 / 62
R0 0.9697 ± 0.0006052
λ 2281 ± 40.03
sig. / ref.
Path Length [cm]

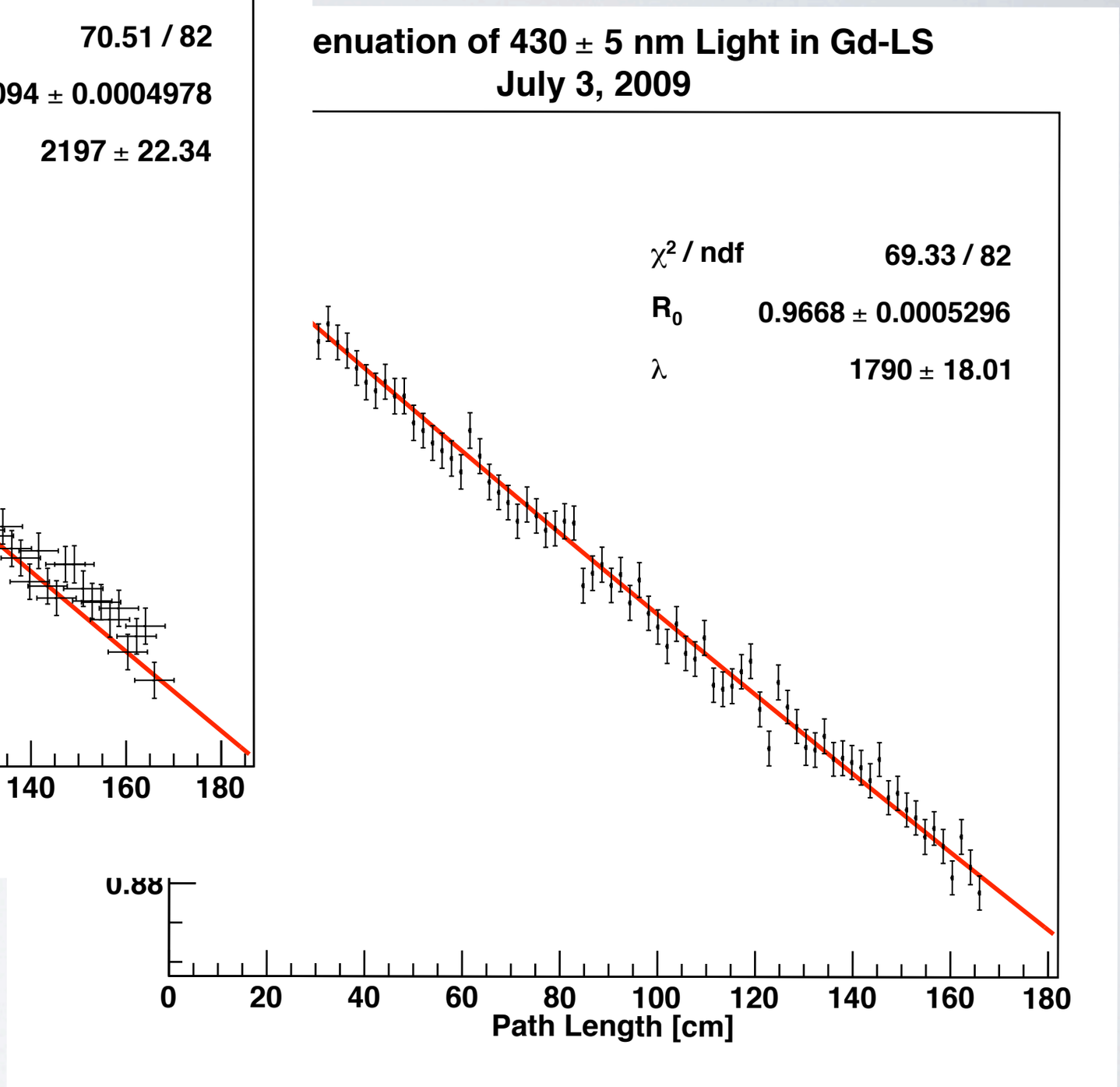

Attenuation of 470 ± 5 nm Light in Purified LAB - July 1, 2009
χ² / ndf 67.21 / 80
R0 1.097 ± 0.0005455
λ 2412 ± 30.62
assume σsys =
Sig. / Ref.
Path Length [cm]

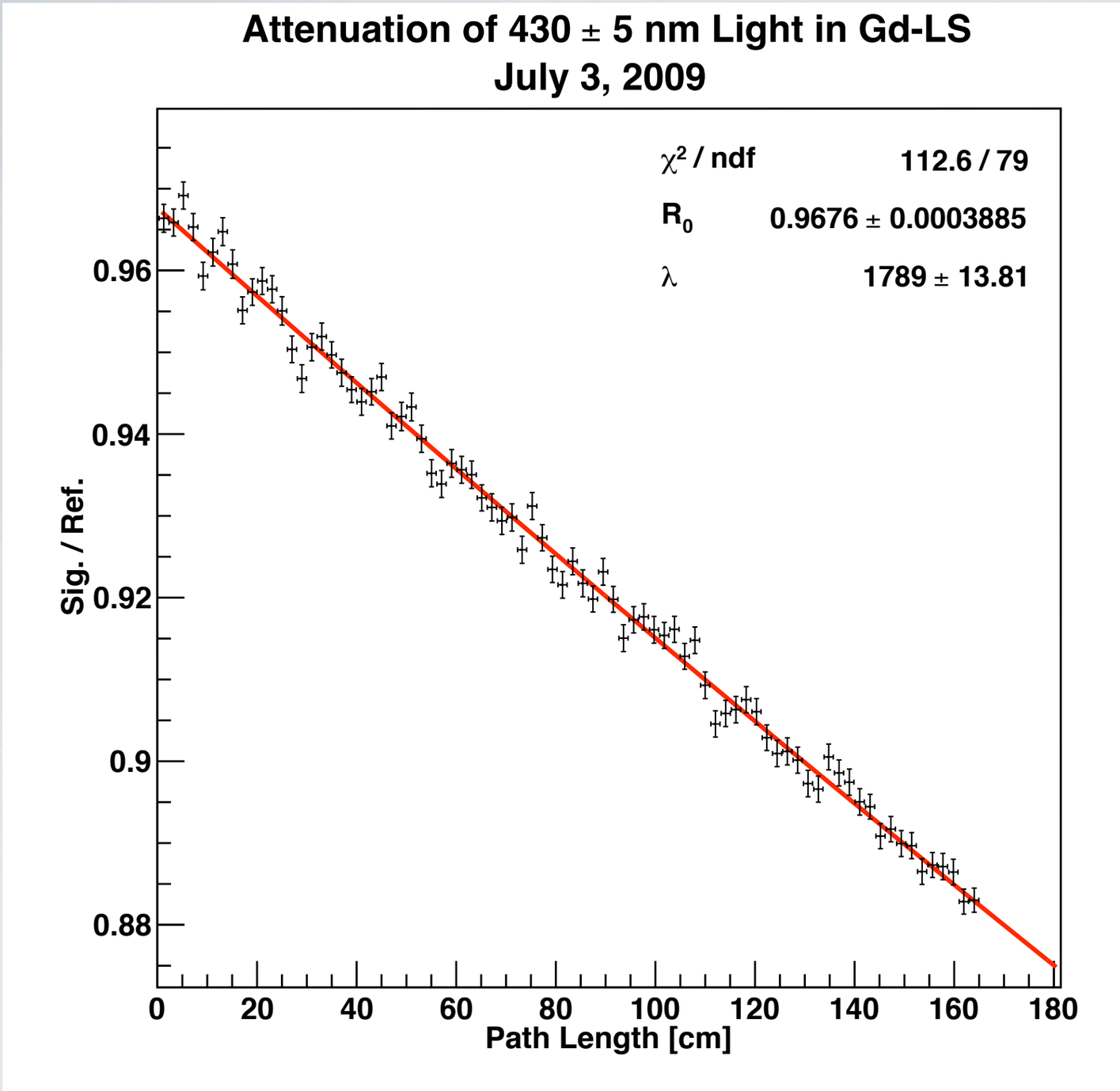

Attenuation of 430 ± 5 nm Light in Purified LAB - 1 July, 2009
χ² / ndf 65.59 / 80
R0 0.9702 ± 0.0005211
λ 2209 ± 27.77
Sig./Ref.
Path Length [cm]

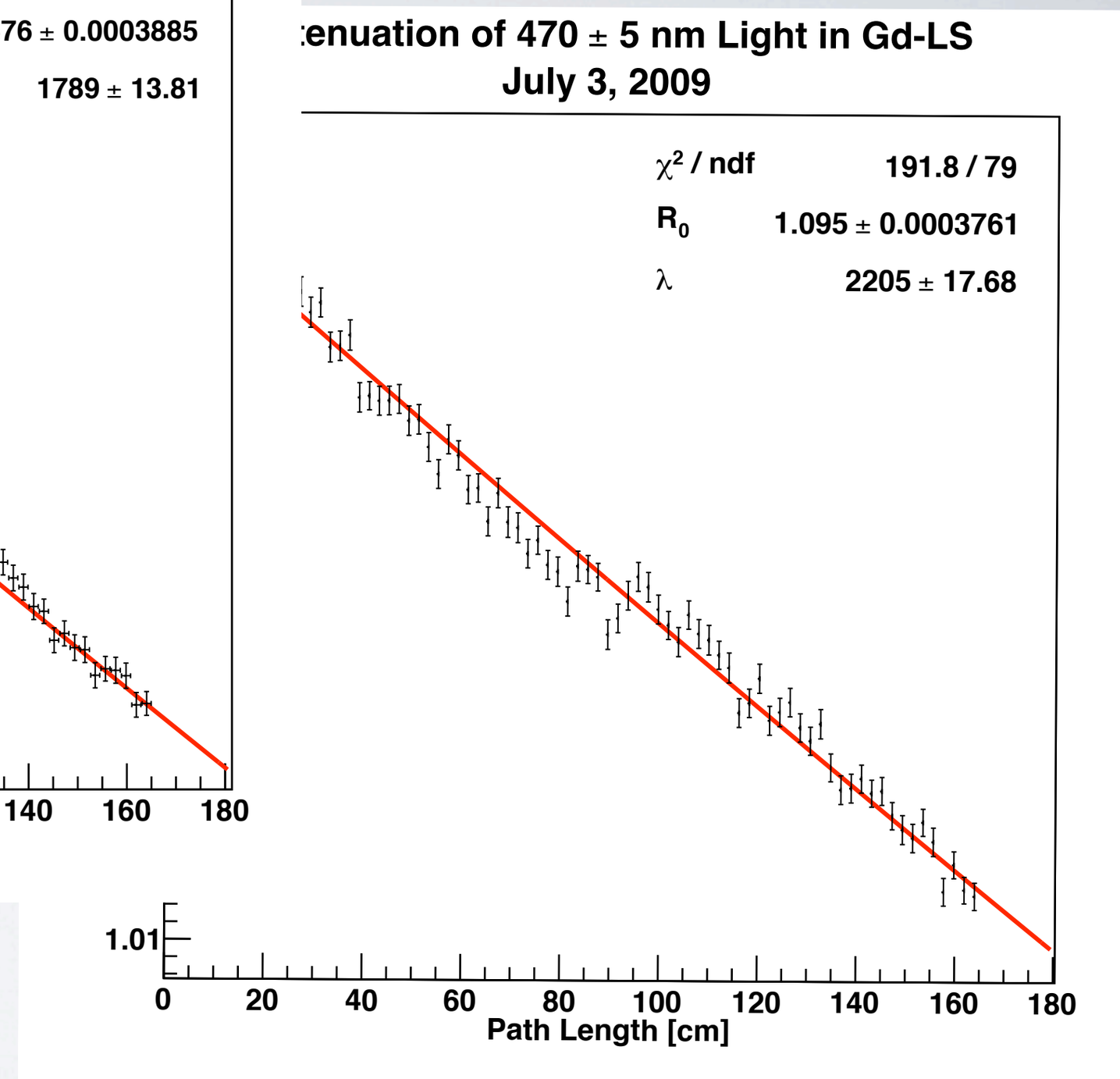
GD-LS SAMPLE #3

- Prepared by Sunej Hans on 6/30/2009
- Purified Petresa LAB from same sample as LAB Sample #3
- Purification of GdCl3 (not used in Samples 1 and 2)


Attenuation of 470 ± 5 nm Light in Gd-LS
July 3, 2009
χ^2 / ndf 70.51 / 82
R_0 1.094 ± 0.0004978
λ 2197 ± 22.34
Sig. / Ref.
1.1
1.08
1.06
1.04
1.02
0
20
40
60
80
100
120
140
160
180
Path Length [cm]


enuation of 430 ± 5 nm Light in Gd-LS
July 3, 2009
χ^2 / ndf 69.33 / 82
R_0 0.9668 ± 0.0005296
λ 1790 ± 18.01
0.88
0
20
40
60
80
100
120
140
160
180
Path Length [cm]


Attenuation of 430 ± 5 nm Light in Gd-LS
July 3, 2009
χ^2 / ndf 112.6 / 79
R_0 0.9676 ± 0.0003885
λ 1789 ± 13.81
Sig. / Ref.
0.96
0.94
0.92
0.9
0.88
0
20
40
60
80
100
120
140
160
180
Path Length [cm]


enuation of 470 ± 5 nm Light in Gd-LS
July 3, 2009
χ^2 / ndf 191.8 / 79
R_0 1.095 ± 0.0003761
λ 2205 ± 17.68
1.01
0
20
40
60
80
100
120
140
160
180
Path Length [cm]

- Series 4 shows a great improvement over previous results, largely due to the automated pump...
- Series 5 repeats these measurements at 430 and 470 nm with the new PMT mount (reducing sensitivity to vibrations), analysis is underway
- Series 6 is underway, and repeats series 5 @ 405 and 430 nm, expect to complete data taking Wednesday August 19