

Orion Calibration 2017

LiNbO₃, 006-reflection green mark, fully centered in om, chi and stt

Slits: 20x10mm² incoming, 50x50mm² before detector

Measurement time: 17.875 Sec. (monitor preset 10'000)
various due to instability of SING (readout 960 mA at wall display)
Adjusted: MOM1, MCV1, MCV2, MVC3 not adjusted, old values 2016
MOM1=875.81, mcv1 -0.085, mcv2=-.085, mcv3=-0085

Second Test 2017: File No. 179: Integrated Intensity 935.8 +/- 7.0
935.8/0.96mA/17.875sec=54.53/mA/sec

First Test 2017: File No. 10: Integrated Intensity 935.8 +/- 7.0
937.2/0.96mA/17sec=57.4/mA/sec

2016-II: 898.4/1.150mA/13.5sec=57.86/mA/sec (file 2016/2056)
2016: 894.2/1.490mA/(9.031-9.25sec)=64.87-66.45/mA/sec
2015: 102.6 for 1.07 seconds and 1480mA SING = 64.35/mA/sec

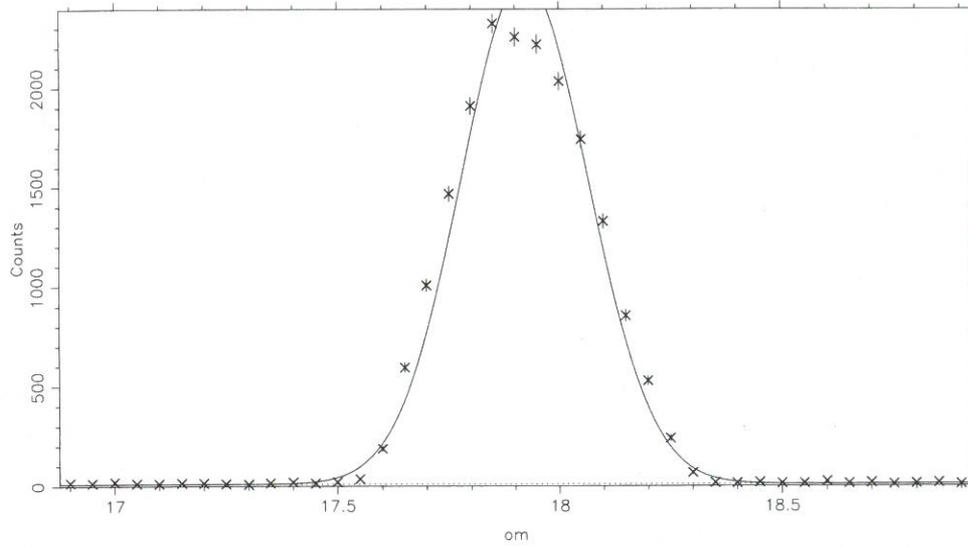
LiNbO3 006(green) in 20x10 mm2 out det open SINQ 960 mA

Position 17.9222 ± 0.0045 Max.Intensity 2532.3 Int.Intensity 910 ± 28 fwhm (Gaussian) 0.3377 ± 0.0061 fwhm (Lorentzian) 0

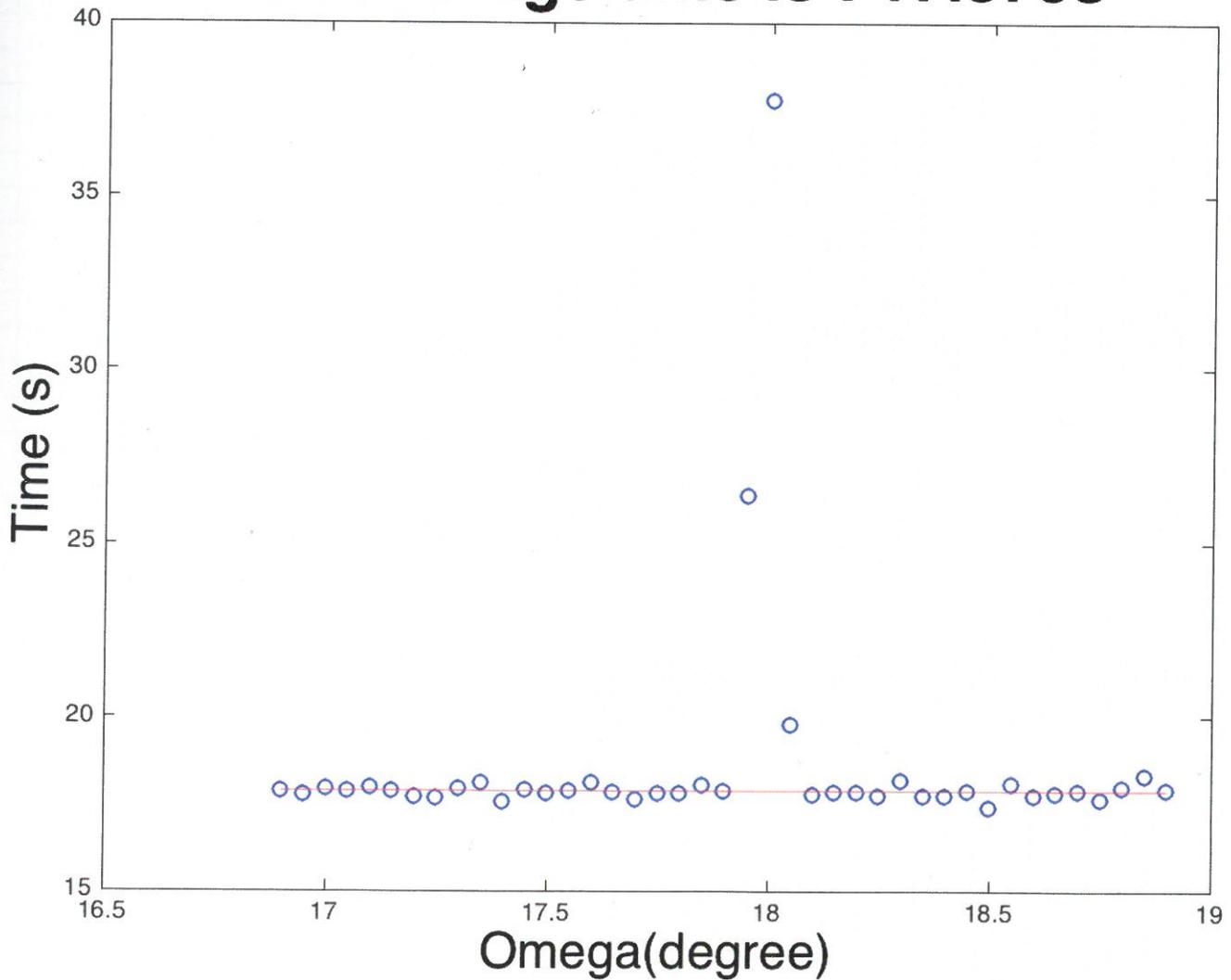
Int.Intens.Exp. 935.8 ± 7.0 Bg(Pos) 10.03 ± 2.86 dBg/dx 0.00545 ± 3.80334

Monitor 10000 WaveLength 2.215
*** χ^2 14.358

orion:2017:179



The average time is : 17.875s



2017 - II

$\lambda = 2.2149$

ph $\rightarrow 0$ \checkmark $\rightarrow 360$ \checkmark
fastscan on (does not seem to make a difference)

006 given make centered
in $10/20 \text{ mm}^2$ out $46 \times 46 \text{ mm}^2$
h kg

centered in stt/chi \rightarrow ph-scan (No. 10)
ca. 17 sec / 10'000 Monitor SING, 960 μA
stt = 57.50, $w = 28.75$, $\text{chi} = 0.22$
 \rightarrow stt softzero -0.2 all others 0

Int Exp = $937.2 / 17 \text{ sec} \approx 10'000$ Monitor
time: 17 sec (960 μA) file No. 10 / 2017

not clear: difference in IntExp (was 898.4)
for the same monitor (?)

LiNbO_3 crystal stored in the shelf (transparent plastic box).

LiNbO3

2017-I

10x20 mm² in / detector open

006, green reflection, centered in w/chi and phi

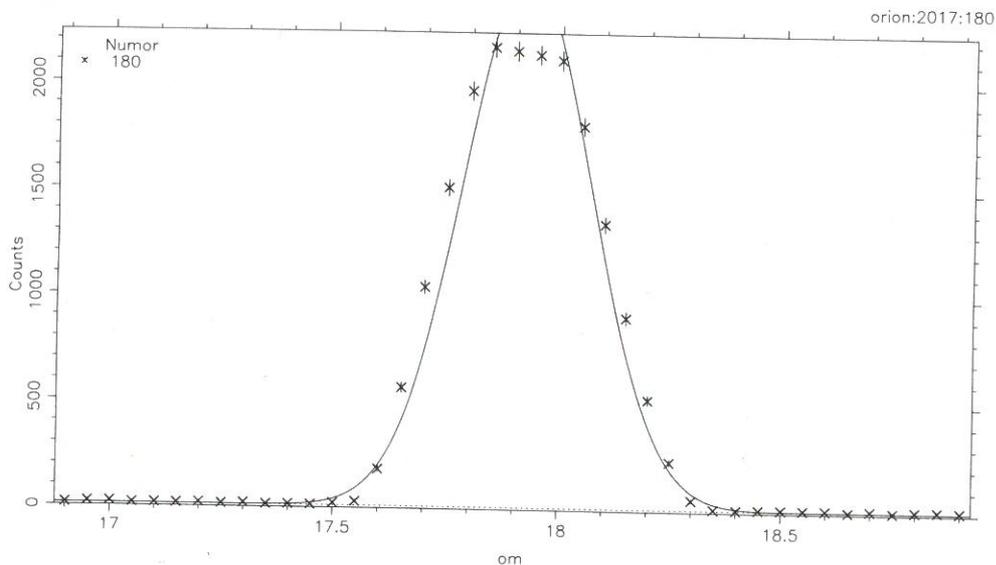
file 179

Int Exp = 935.8 ± 7 ~ 970 int

time = 960 mA @ 10'000 Count = 17.5 s

LiNbO3 006(green) in 30x20 mm² out det open SING 980 mA

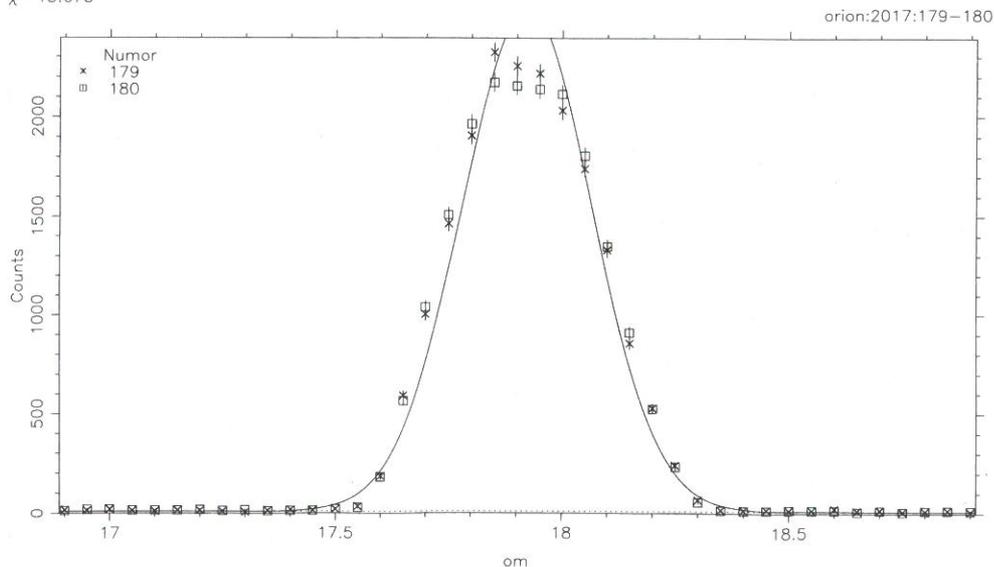
Position 17.9240 ± 0.0048	Max.Intensity 2516.2	Int.Intensity 901 ± 28	fwhm (Gaussian) 0.3365 ± 0.0068	fwhm (Lorentzian) 0
Int.Intens.Exp. 935.0 ± 7.0	Bg(Pos) 9.92 ± 3.38	dBg/dx -1.604 ± 4.567		
Monitor 10000	WaveLength 2.215			
*** χ^2 18.956				



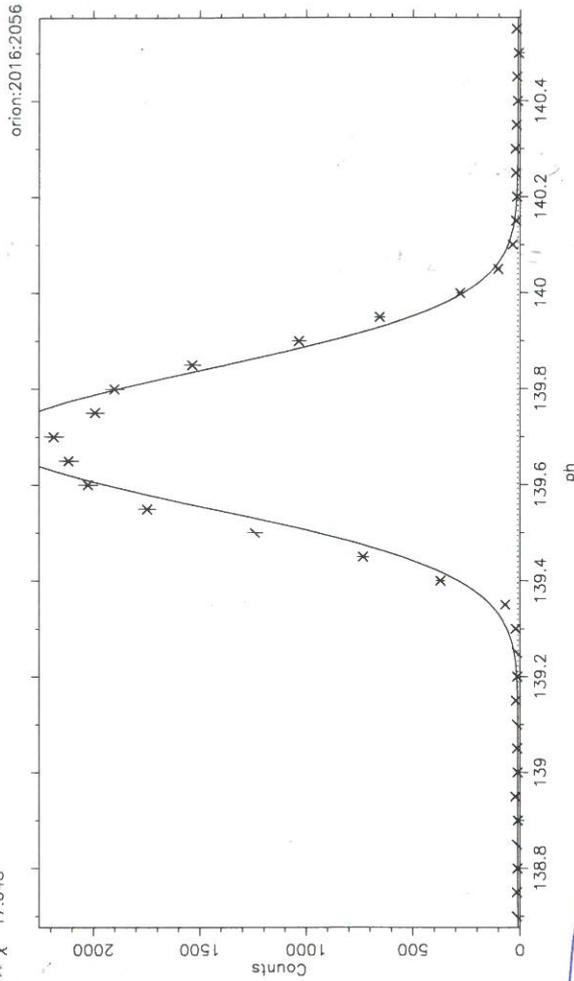
Comparison 20x10 and 30x20

LiNbO3 006(green) in 30x20 mm² out det open SING 980 mA

Position 17.9222 ± 0.0045	Max.Intensity 2532.3	Int.Intensity 910 ± 28	fwhm (Gaussian) 0.3377 ± 0.0061	fwhm (Lorentzian) 0
Int.Intens.Exp. 1873 ± 13	Bg(Pos) 10.03 ± 2.86	dBg/dx 0.00545 ± 3.80334		
Monitor 10000	WaveLength 2.215			
χ^2 15.675				



LiNbO3 Detector Tube T.5139 replaced by T.5140 (Threshold: 300mV, 1500 Volt)
 Position 139.6969 ± 0.0047 Max.Intensity 2433.9 fwhm (Goussian) 0
 Int.Intensity 87.1 ± 2.4 fwhm (Lorentzian) 0
 Int.Intens.Exp. 898.4 ± 6.9 Bg(Pos) 10.10 ± 3.44 dBg/dx 0.3555 ± 4.734
 Monitor 10000 Wavelength 2.215
 *** X 17.048



Dec. 2016 - II

new detector tube

1150 μ A

13.5 sec
mon = 10'000

$w = 28.63^\circ$
 $2\theta = 57.27^\circ$
 $\tau = -0.205^\circ$
 no collimation

new tube: T.5140

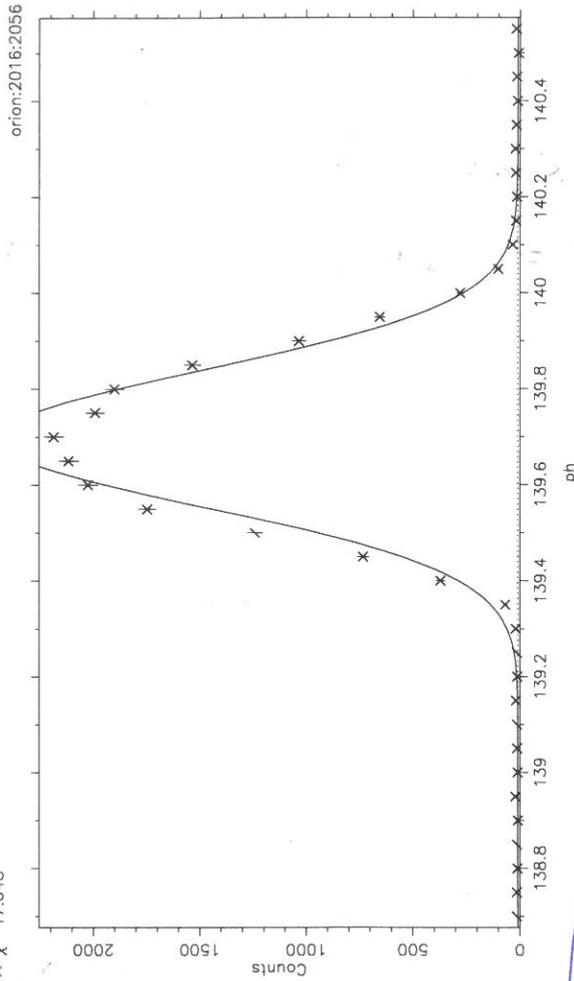
→ keine Flussänderung oder Änderung Detektor performance

Dr. Jürg Schefer
 Laboratory for Neutron Scattering
 and Imaging
 Paul Scherrer Institut, WHGA-244
 CH-5232 Villigen PSI,
 Switzerland

2.12.2016, 17¹² h

2016-II

LiNbO3 Detector Tube T.5139 replaced by T.5140 (Threshold: 300mV, 1500 Volt)
 Position 139.6969 ± 0.0047 Max.Intensity 2433.9 fwhm (Goussian) 0
 Int.Intensity 87.1 ± 2.4 fwhm (Lorentzian) 0
 Int.Intens.Exp. 898.4 ± 6.9 Bg(Pos) 10.10 ± 3.44 dBg/dx 0.3555 ± 4.734
 Monitor 10000 Wavelength 2.215
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new tube: T.5140

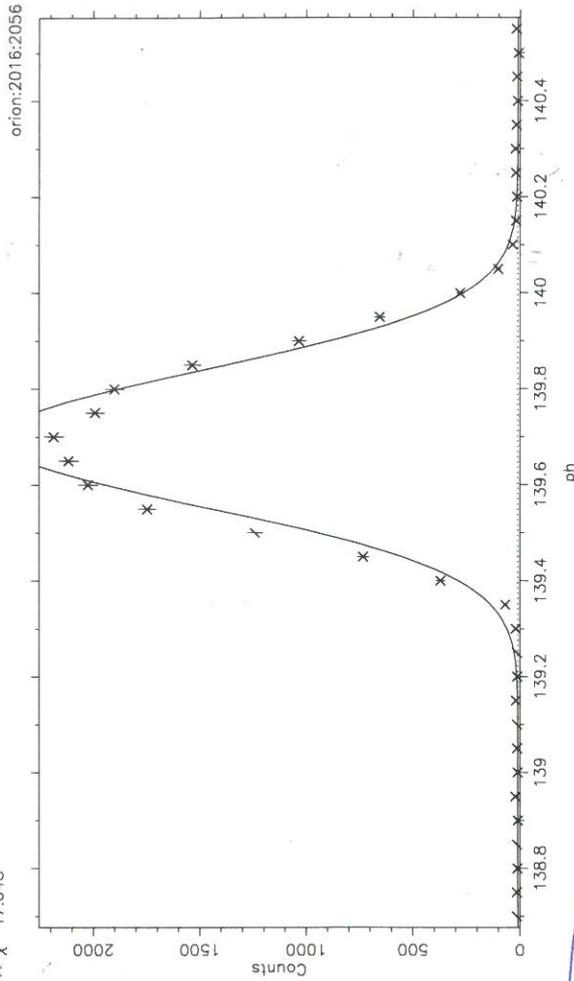
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2.12.2016, 17¹² h

2016-II

LiNbO3 Detector Tube T.5139 replaced by T.5140 (Threshold: 300mV, 1500 Volt)
 Position 139.6969 ± 0.0047 Max.Intensity 2433.9 Int.Intensity 871 ± 24 fwhm (Goussian) 0
 Int.Intens.Exp. 898.4 ± 6.9 Bg(Pos) 10.10 ± 3.44 dBg/dx 0.3555 ± 4.734 fwhm (Lorentzian) 0
 Monitor 10000 Wavelength 2.215 *** X 17.048



Dec. 2016 - II

new detector tube

1150 μ A

13.5 sec
mon = 10'000

$w = 28.63^\circ$
 $2\theta = 57.27^\circ$
 $\tau = -0.205^\circ$
 no collimation

new tube: T.5140

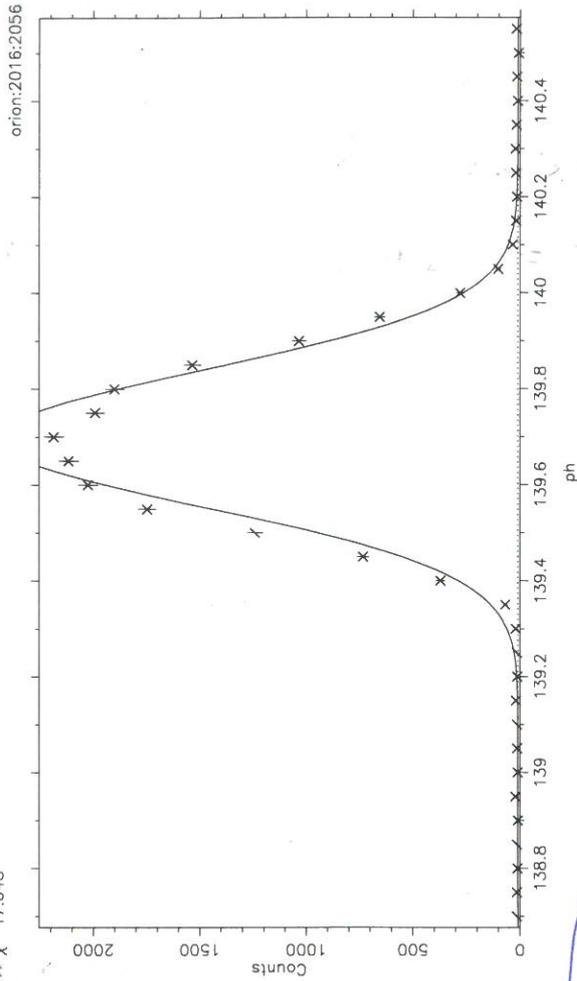
→ keine Flussänderung oder Änderung Detektor performance

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2.12.2016, 17¹² h

2016-II

LiNbO3 Detector Tube T.5139 replaced by T.5140 (Threshold: 300mV, 1500 Volt)
 Position 139.6969 ± 0.0047 Max.Intensity 2433.9 fwhm (Goussian) 0
 Int.Intensity 871 ± 24 fwhm (Lorentzian) 0
 Int.Intens.Exp. 898.4 ± 6.9 Bg(Pos) 10.10 ± 3.44 dBg/dx 0.3555 ± 4.734
 Monitor 10000 Wavelength 2.215
 *** X 17.048



Dec. 2016 - II

new detector tube

1150 μ A

13.5 sec

mon = 10'000

$\omega = 28.63^\circ$

$2\theta = 57.27^\circ$

$\tau = -0.205^\circ$

no collimation

new tube: T.5140

→ keine Flussänderung oder
Änderung Detektor performance

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2.12.2016, 17¹² h

2016-II

LiNbO3

2017-I

10x20 mm² in / detector open

006, green reflection, centered in w/chi and phi

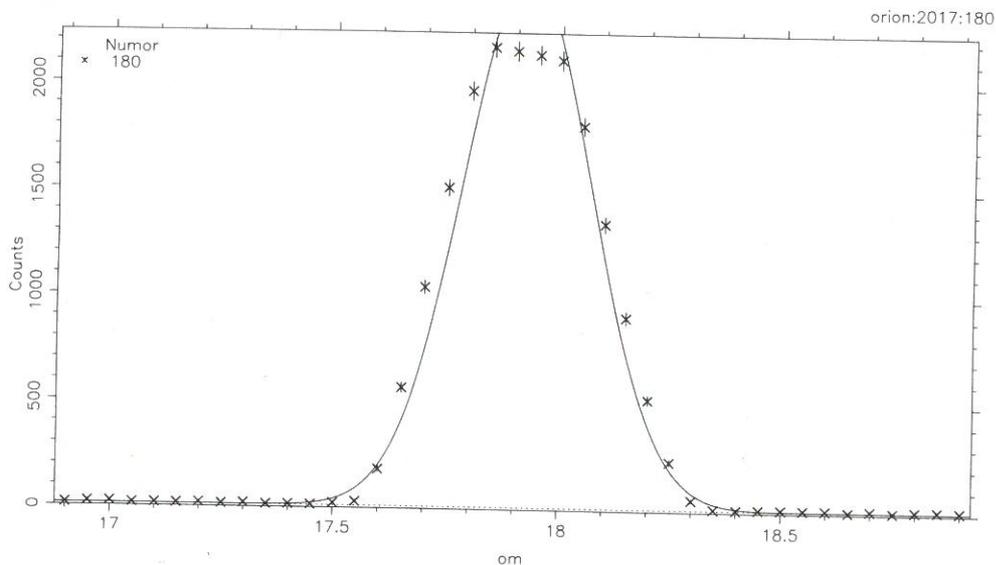
file 179

Int Exp = 935.8 ± 7 ~ 970 int

time = 960 mA @ 10'000 Count = 17.5 s

LiNbO3 006(green) in 30x20 mm² out det open SING 980 mA

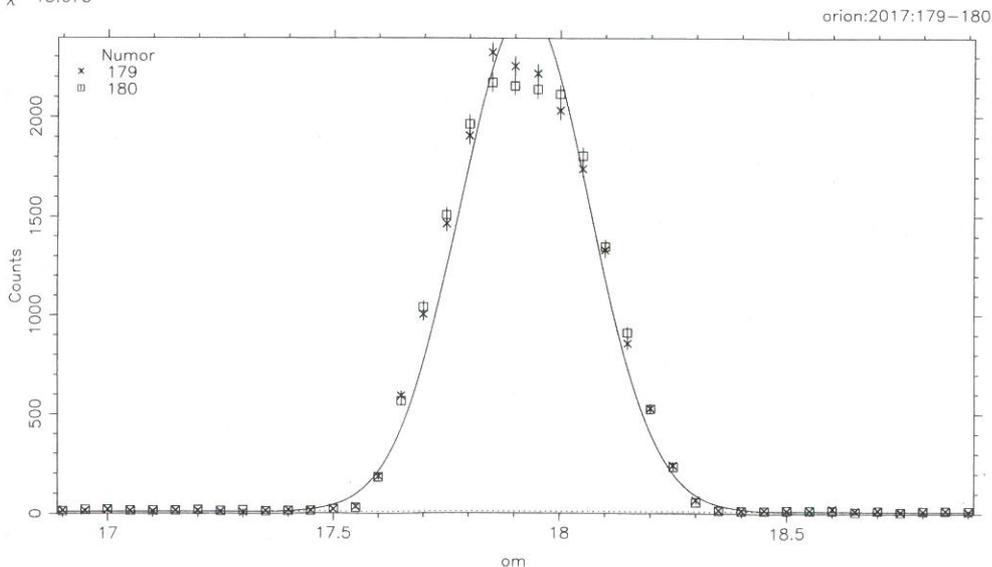
Position	Max.Intensity	Int.Intensity	fwhm (Gaussian)	fwhm (Lorentzian)
17.9240 ± 0.0048	2516.2	901 ± 28	0.3365 ± 0.0068	0
Int.Intens.Exp.	Bg(Pos)	dBg/dx		
935.0 ± 7.0	9.92 ± 3.38	-1.604 ± 4.567		
Monitor 10000	WaveLength 2.215			
*** χ^2 18.956				



Comparison 20x10 and 30x20

LiNbO3 006(green) in 30x20 mm² out det open SING 980 mA

Position	Max.Intensity	Int.Intensity	fwhm (Gaussian)	fwhm (Lorentzian)
17.9222 ± 0.0045	2532.3	910 ± 28	0.3377 ± 0.0061	0
Int.Intens.Exp.	Bg(Pos)	dBg/dx		
1873 ± 13	10.03 ± 2.86	0.00545 ± 3.80334		
Monitor 10000	WaveLength 2.215			
χ^2 15.675				



Orion Calibration 2016

LiNbO₃, 006-reflection green mark, fully centered in om, chi and stt

Slits: 20x20mm² incoming, 20x50mm² before detector

Measurement time: 9.031 to 9.25 seconds (monitor preset 10'000)
various due to instability of SINO (readout 1490 mA at wall display)

Adjusted: MOM1, MCV1, MCV2, MVC3

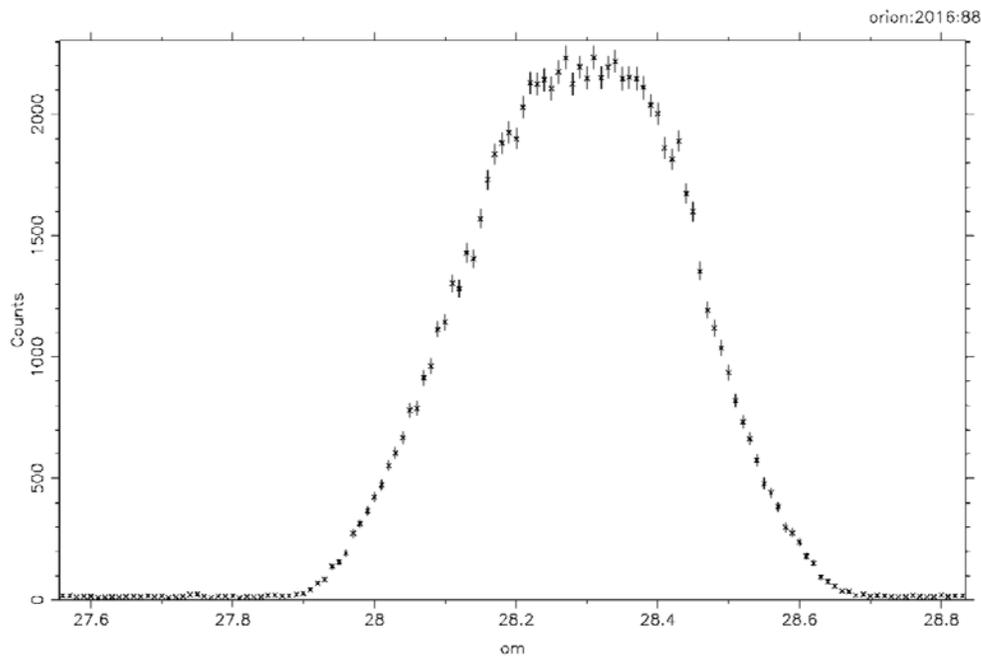
File No. 88: Integrated Intensity 894.2 +/- 3.0, File 110.ccl data-set

2016: $894.2/1.490\text{mA}/(9.031-9.25\text{sec})=64.87-66.45/\text{mA}/\text{sec}$

2015: 102.6 for 1.07 seconds and 1480mA SINO = 64.35/mA/sec

Flux-comparison to 2015: **increase to 1.008-1.032, identical within errors**

LiNbO₃ slit 20/40mm 20x50mm SINO 1470mA Sample=LiNbO₃ 20x20mm 20x50mm
Monitor 10000 WaveLength 2.216



May 2016, Schefer

Orion Calibration 2015

LiNbo 006 peak 1/2cm slit stt scan Sample=OMCL

Position
57.475 ± 0.050

Max.Intensity
310.3

Int.Intensity
556 ± 41

fwhm (Gaussian)
1.683 ± 0.053

fwhm (Lorentzian)
0

Int.Intens.Exp.
732.8 ± 8.6

Bg(Pos)
0

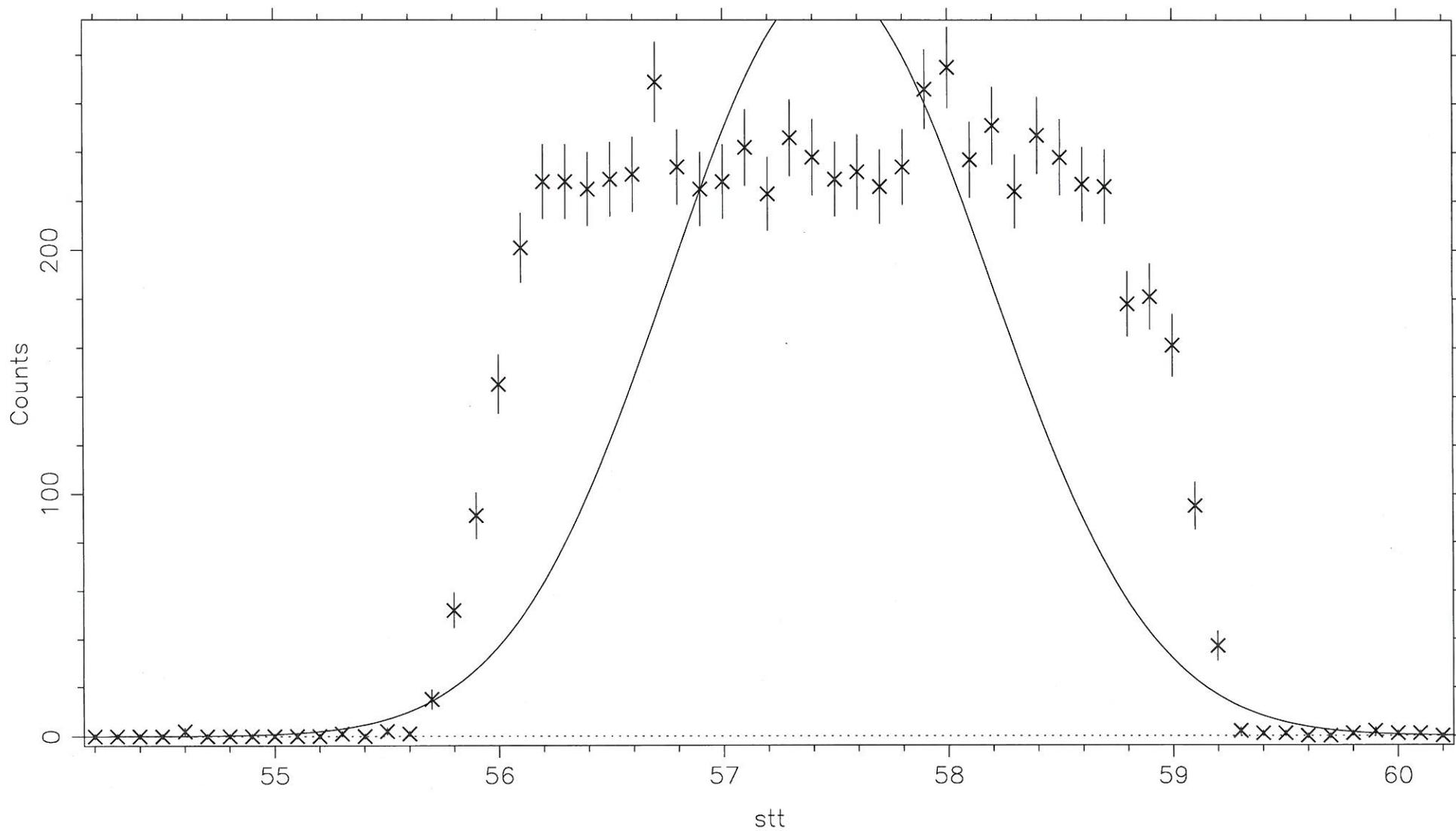
dBg/dx
0

1470 mK

Monitor 1200 WaveLength 2.215

*** χ^2 30.75

orion:2015:32



LiNbO 006 peak 1/2cm slit som scan Sample=OMCL

Position
28.5992 ± 0.0030

Max.Intensity
269.3

Int.Intensity
96.4 ± 1.9

fwhm (Gaussian)
0.3363 ± 0.0044

fwhm (Lorentzian)
0

Int.Intens.Exp.
100.6 ± 1.0

Bg(Pos)
-0.647 ± 0.384

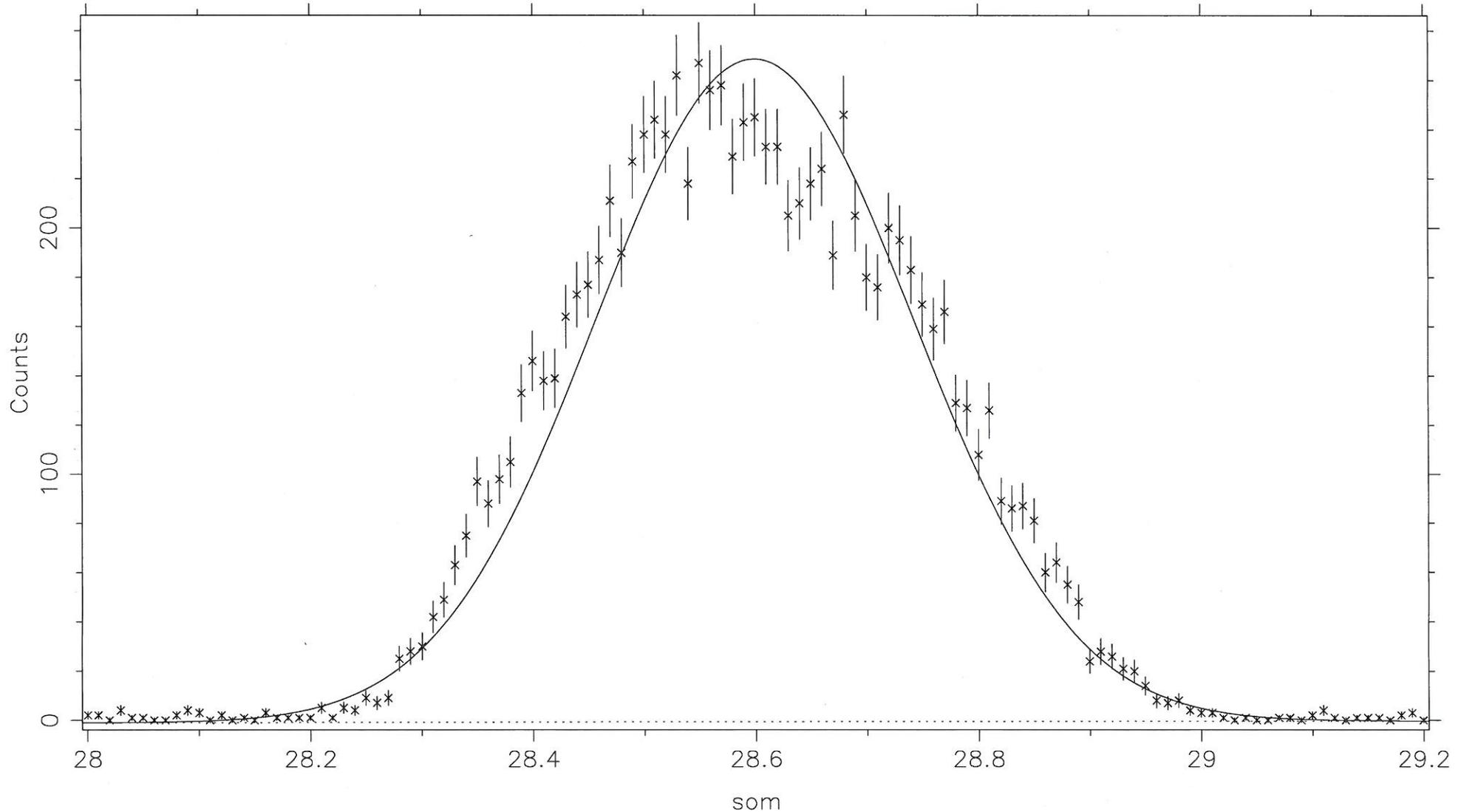
dBg/dx
0.626 ± 0.683

1476 mA

Monitor 1200 WaveLength 2.215

*** χ^2 3.717

orion:2015:33



1476 uA

LiNbo 006 peak slits open som scan Sample=OMCL

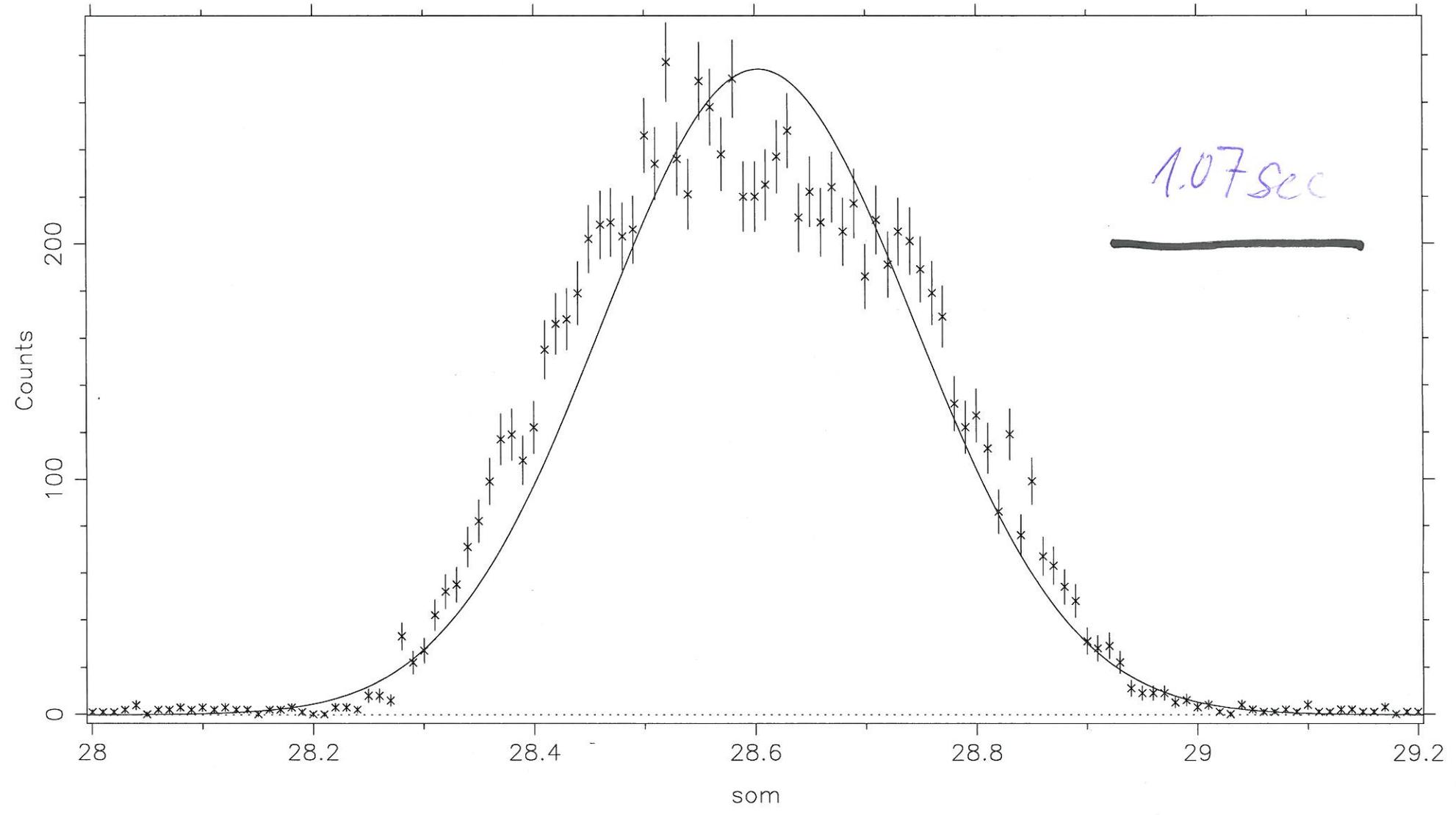
Position	Max.Intensity	Int.Intensity	fwhm (Gaussian)	fwhm (Lorentzian)
28.6032 ± 0.0031	274.3	97.3 ± 2.0	0.3333 ± 0.0037	0

Int.Intens.Exp.	Bg(Pos)	dBg/dx
102.6 ± 1.0	-0.231 ± 0.339	0

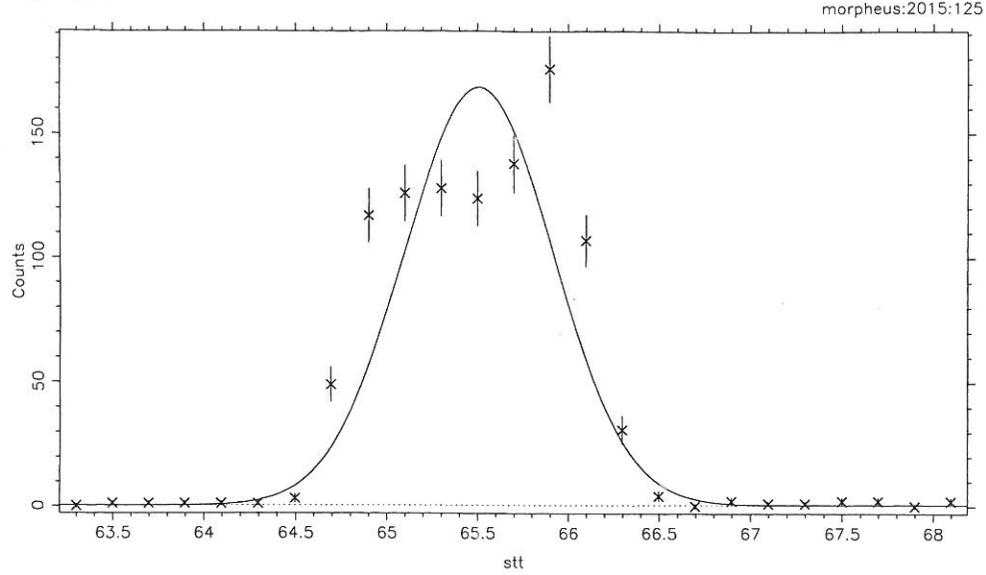
Monitor 1200 WaveLength 2.215

*** χ^2 4.653

orion:2015:34



LiNbO3 006 2.5A (1/2)
 Position 65.506 ± 0.041 Max.Intensity 168.35 Int.Intensity 172.2 ± 16.2 fwhm (Gaussian) 0.961 ± 0.050 fwhm (Lorentzian) 0
 Int.Intens.Exp. 201.3 ± 6.4 Bg(Pos) 0.345 ± 0.838 dBg/dx 0.0845 ± 0.4411
 Monitor 5000 WaveLength 5
 *** χ^2 7.544

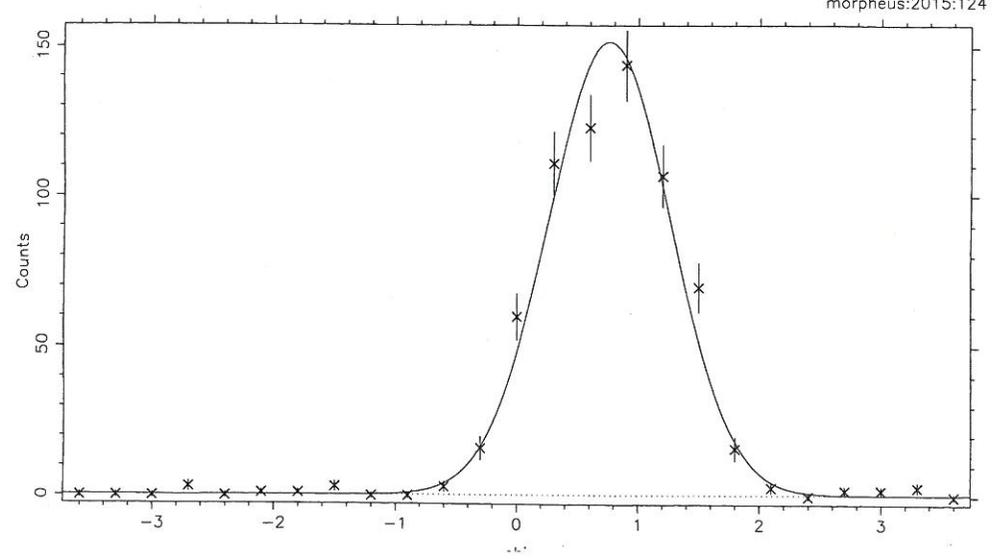


Vergleich ORION - Morpheus

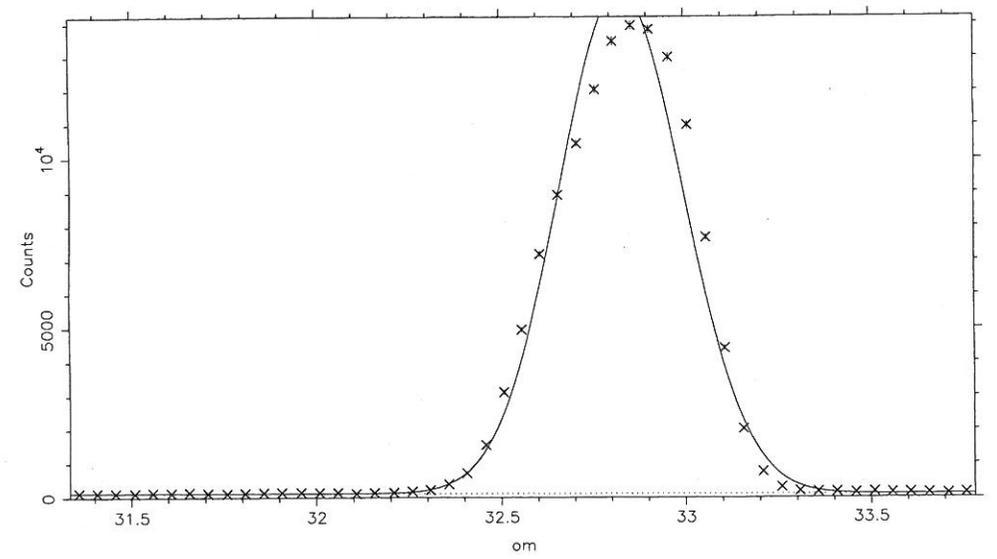
Vergleich Morpheus - Orion (13.5.2015)

006	Morpheus	Orion
Lambda	2.5A	2.2141A
Time	8.3s	1.07s
SINQ	1460mA	1470mA
Peak	14898.9	274.3
Background	112.4/-21.8	-0.21/-0.34
Run	126	33
Integrated Intensity	8.11	1
Wellenlängen- bereinigt	6.36	1
Peak	7.05	1
Wellenlängen- bereinigt	5.5	1

LiNbO3 006 2.5A (1/2)
 Position 0.761 ± 0.024 Max.Intensity 151.52 Int.Intensity 190.5 ± 7.9 fwhm (Gaussian) 1.181 ± 0.033 fwhm (Lorentzian) 0
 Int.Intens.Exp. 197.5 ± 7.8 Bg(Pos) 0.452 ± 0.404 dBg/dx 0.0358 ± 0.1302
 Monitor 5000 WaveLength 5
 *** χ^2 1.3493

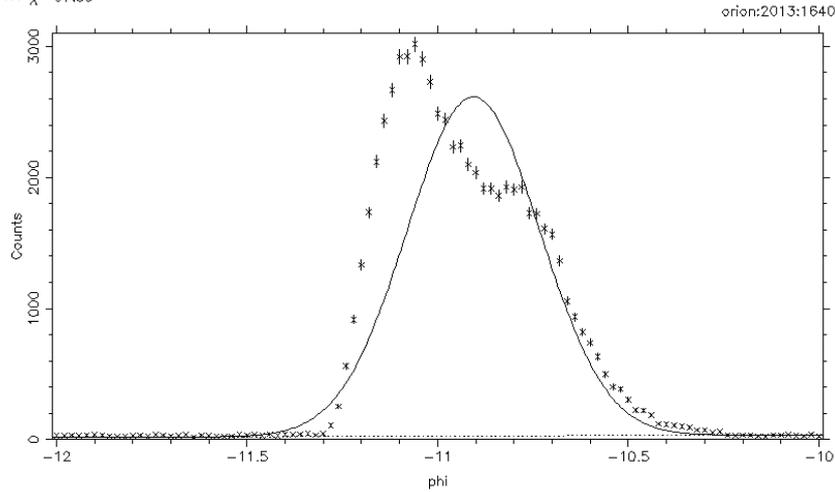


LiNbO3 006 2.5A (1/2)
 Position 32.8294 ± 0.0029 Max.Intensity 14898.9 Int.Intensity 6250 ± 178 fwhm (Gaussian) 0.3941 ± 0.0067 fwhm (Lorentzian) 0
 Int.Intens.Exp. 6411 ± 21 Bg(Pos) 112.4 ± 21.8 dBg/dx -12.38 ± 22.26
 Monitor 500000 WaveLength 5
 *** χ^2 74.47

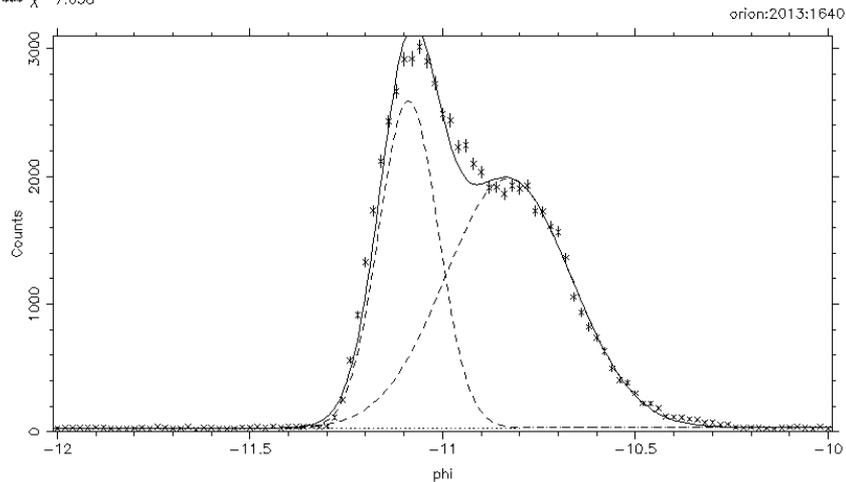


Phi:
fwhm: 0.55 max int expt: 3000 mon: 12000

HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position -10.9066 ± 0.0086 Max.Intensity 2586.6 Int.Intensity 1126 ± 54 fwhm (Gaussian) 0.409 ± 0.013 fwhm (Lorentzian) 0
 Int.Intens.Exp. 1313.3 ± 5.6 Bg(Pos) 28.5 ± 7.9 dBg/dx 10.42 ± 10.33
 Monitor 12000 WaveLength 2.215
 *** χ^2 97.59

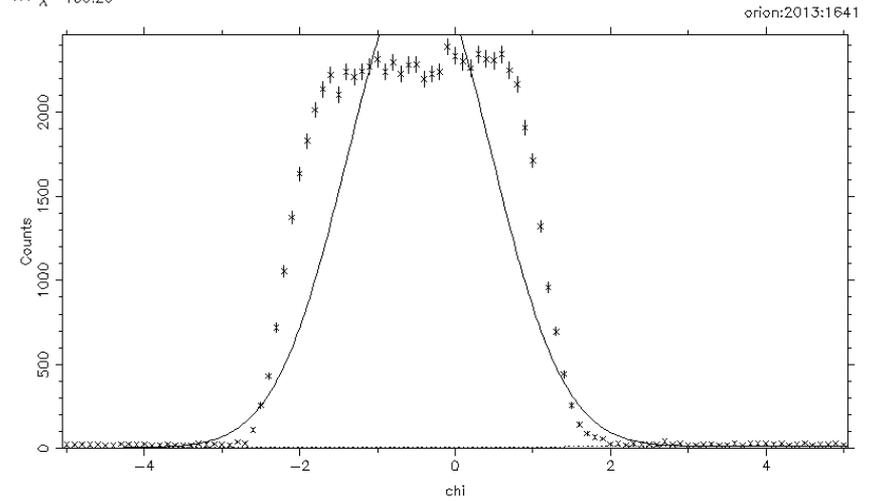


HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position -10.8300 ± 0.0055 Max.Intensity 1952.9 Int.Intensity 797 ± 23 fwhm (Gaussian) 0.3836 ± 0.0067 fwhm (Lorentzian) 0
 Int.Intens.Exp. -11.0886 ± 0.0029 2562.3 494 ± 21 0.1811 ± 0.0046 0
 Int.Intens.Exp. 1305.8 ± 5.3 Bg(Pos) 32.1 ± 2.5 dBg/dx 4.34 ± 3.09
 Monitor 12000 WaveLength 2.215
 *** χ^2 7.638

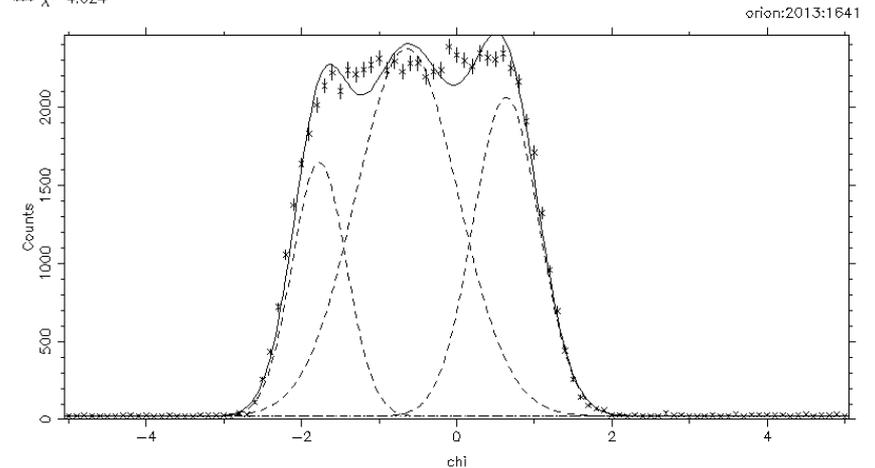


Chi:
fwhm: 3

HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position -0.455 ± 0.036 Max.Intensity 2873.4 Int.Intensity 6654 ± 257 fwhm (Gaussian) 2.175 ± 0.057 fwhm (Lorentzian) 0
 Int.Intens.Exp. 7616 ± 31 Bg(Pos) 10.08 ± 12.87 dBg/dx 1.185 ± 1.105
 Monitor 12000 WaveLength 2.215
 *** χ^2 100.29

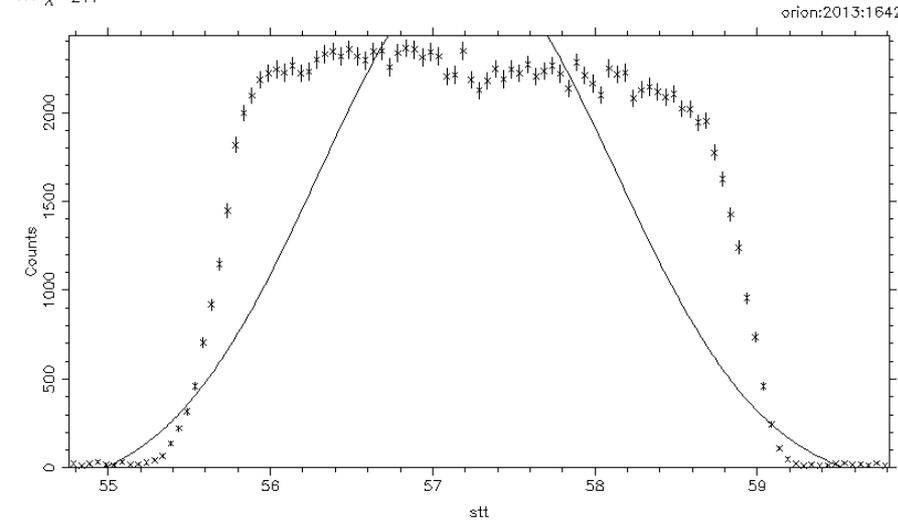


HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position 0.637 ± 0.031 Max.Intensity 2040.4 Int.Intensity 2173 ± 172 fwhm (Gaussian) 1.000 ± 0.035 fwhm (Lorentzian) 0
 Int.Intens.Exp. -1.769 ± 0.024 1626.7 1415 ± 119 0.817 ± 0.031 0
 Int.Intens.Exp. -0.641 ± 0.054 2355.0 3867 ± 181 1.542 ± 0.063 0
 Int.Intens.Exp. 7498 ± 28 Bg(Pos) 22.8 ± 1.3 dBg/dx 0.504 ± 0.411
 Monitor 12000 WaveLength 2.215
 *** χ^2 4.624



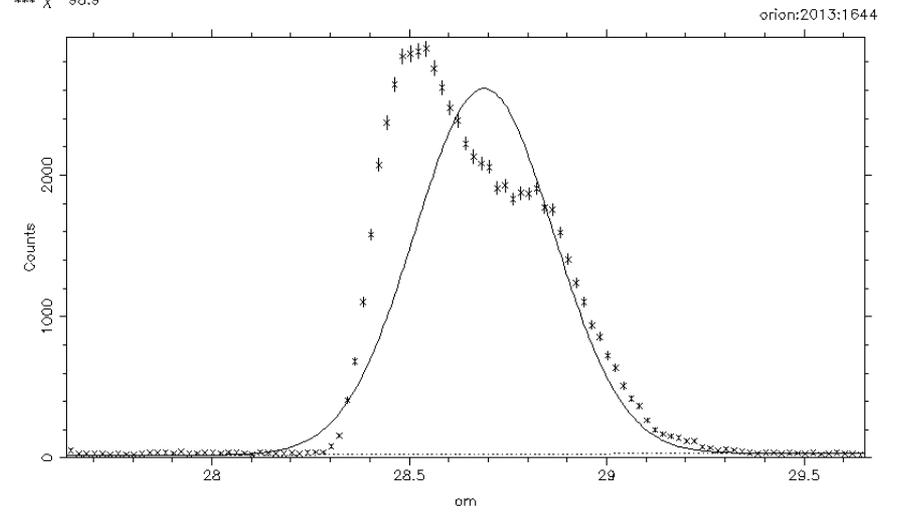
STT fwhm: 3.3

HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position 57.213 ± 0.026 Max.Intensity 2959.1 Int.Intensity 6788 ± 243 fwhm (Gaussian) 2.155 ± 0.035 fwhm (Lorentzian) 0
 Int.Intens.Exp. 7889 ± 21 Bg(Pos) -132.2 ± 13.7 dBg/dx 7.80 ± 6.11
 Monitor 12000 WaveLength 2.215
 *** χ^2 241

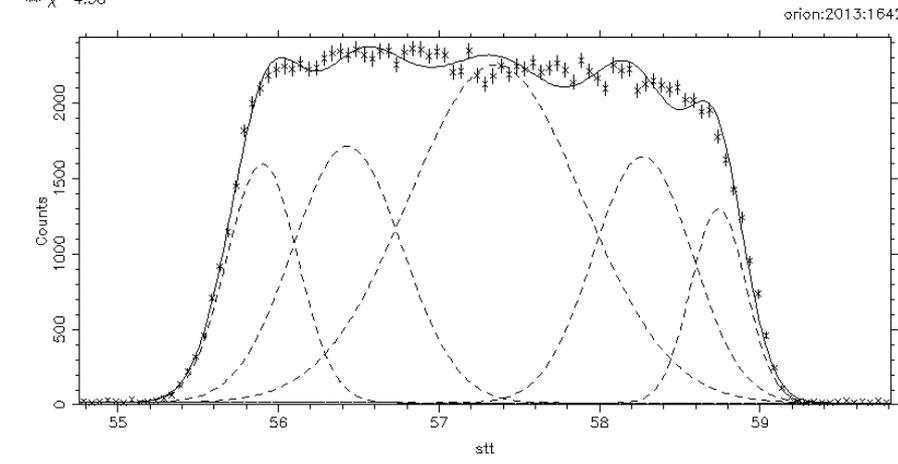


Omega

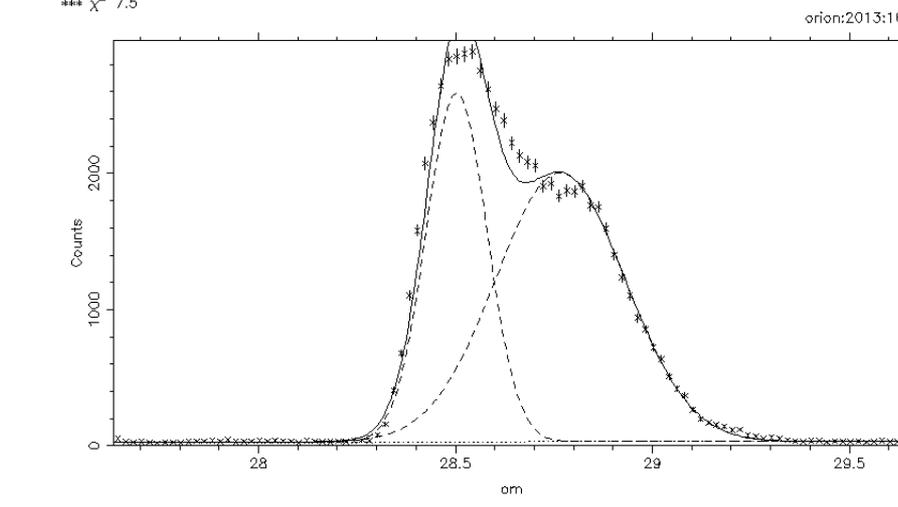
HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position 28.6895 ± 0.0088 Max.Intensity 2584.9 Int.Intensity 1139 ± 44 fwhm (Gaussian) 0.414 ± 0.012 fwhm (Lorentzian) 0
 Int.Intens.Exp. 1328.0 ± 5.6 Bg(Pos) 26.6 ± 7.3 dBg/dx 9.98 ± 10.25
 Monitor 12000 WaveLength 2.215
 *** χ^2 98.9



HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position 57.353 ± 0.016 Max.Intensity 2239.5 Int.Intensity 3030 ± 47 fwhm (Gaussian) 1.271 ± 0.025 fwhm (Lorentzian) 0
 55.899 ± 0.012 1681.4 874 ± 80 0.519 ± 0.012 0
 58.741 ± 0.011 1284.4 550 ± 47 0.403 ± 0.014 0
 56.430 ± 0.021 1696.1 1447 ± 130 0.801 ± 0.048 0
 58.270 ± 0.017 1632.9 1256 ± 61 0.723 ± 0.023 0
 Int.Intens.Exp. 7170 ± 19 Bg(Pos) 13.55 ± 2.09 dBg/dx -0.987 ± 0.934
 Monitor 12000 WaveLength 2.215
 ** χ^2 4.58



HKL: 0 0 6 Sample=LiNbO Standard ac plane
 Position 28.5027 ± 0.0031 Max.Intensity 2559.6 Int.Intensity 495 ± 23 fwhm (Gaussian) 0.1815 ± 0.0049 fwhm (Lorentzian) 0
 28.7661 ± 0.0061 1971.4 810 ± 25 0.3861 ± 0.0080 0
 Int.Intens.Exp. 1318.6 ± 5.3 Bg(Pos) 30.4 ± 2.2 dBg/dx 2.87 ± 2.90
 Monitor 12000 WaveLength 2.215
 *** χ^2 7.5



Orion Calibration 2014

Standard Sample Measurements Orion 2013

- Sample: LiNbO₃
- Collimation: None
- Script: LNO.tcl
- Runs numbers:
1640,1641,1642,1644
- Alignment: ac plane
- Measured peak: 0 0 6
 - Green line indicates bisecting position
- SinQ power: 1530 μ A
- Monitor per point: 12000 cnts
- Approx time per point: 77.5s

