

// 14.12.8 29/08/20

// moving all d\_CN\*\_base dialogs to directory d\_CN/d\_CN\_base/

// revision of all Choose Nucleus (CN) dialogs regarding to TableNuclides button mode : 10%

// d\_Wien dialog : redesign 100%, connection 80%

**Wien**

**Wien Velocity Filter settings**

Select constant parameters if Brho changes

- Electric field E = 169.23077 kV/m
- Magnetic field B = 12.91749 Gauss
- Dispersion (SECAR) D = 0.000 mm/%

Filter settings correspond to a Brho-value for the setting fragment 7.1577 Tm

**Separation velocity plane**

- Horizontal (VAMOS)
- Vertical (LISE3)

**Bending Direction**

- Clockwise (default)
- CounterClockwise

**Filter constants**

Dispersion coefficient -8.4582e-05

Electric & magnetic effective lengths relation ( $L_E / L_B$ ) 1.3

**Utilities**

"Classical" solution for the Dispersion coefficient -1.518e-04

**Optical block properties and data**

Section-Element construction property

S-block (Section)  E-block (Element)

Setting Charge state for the Block (Z-q) 0

Tweak 1.000 %

Slits & Acceptances

Optical matrix

General block settings

E=R\* Ch+B Calibration file

**Matrix calculation**

Matrix calculations  Allow remote matrices calculations

**Calculate Values using**

Setting fragment from

Target

D1

**Calculate other blocks**

Up-stream

ALL

Down-stream

**Lengths (m)**

Wien filter 2.4 Block (total) 2.4

OK Cancel Help

**Choose nucleus**

A	Element	Z	Table of Nuclides	
40	Mg	12	← Z →	
Beta- decay			← N →	

OK Cancel

//-----  
 // 14.12.9 30/08/20  
 // revision of all Choose Nuclues (CN) dialogs regarding to TableNuclides button mode : 30%

// d\_Wien dialog : DONE!

**Qt**

**Borland**



# LISE cute status 08/31

//-----  
 // 14.12.10 31/08/20  
 // revision of all Choose Nuclues (CN) dialogs regarding to TableNuclides button mode : 35%

// Borland Levmar package finally has been implemented in LISEcute : 100%

// d\_Optics\_fitSet dialog : DONE!

Levmar minimization settings

Options

Maximum number of iterations

Use Lower & Upper bounds

LevMar package samples

Choose example (0-15)

LevMar package info

LEVMAR:  
 Levenberg-Marquardt  
 nonlinear least squares  
 algorithms by M.I.A.Lourakis

Make default

\* delta – difference approximation step, used only in the Bounds mode. If delta<0, the Jacobian is approximated with central differences which are more accurate (but slower!) compared to the forward differences employed by default.

Qt

Borland

Qt LevMar 4 00.log

```

  Save As Print
  LevMar 4 00.log
  Jacob: No, Box: No
  =====
  ==> Results for Meyer's (reformulated) problem(4):
  Levenberg-Marquardt returned 2 in 2 iter, reason 3
  Solution: 8.910196 4.746277 2.754765
  =====
  Options info:
  0: 1.000e-003      mu
  1: 1.000e-015     epsilon1 ||J^T e||_inf
  2: 1.000e-015     epsilon2 ||Dp||_2
  3: 1.000e-020     epsilon3 ||e||_2
  4: 1.000e-006     delta approx.step
  =====
  Minimization info:
  0: 1.308e+003      ||e||_2 at initial p
  1: 9.015e+002      ||e||_2
  2: 3.645e+003      ||J^T e||_inf
  3: 1.766e-001      ||Dp||_2
  4: 1.823e-003      mu/max[J^T J]_ii
  5: 2              # iterations
  6: 3              reason for terminating
  7: 6              # function evaluations
  =====
  LevMar 4 01.log
  Jacob: No, Box: Yes
  Low Bounds: +1 +1 +1
  Upp Bounds: +9 +9 +9
  =====
  ==> Results for Meyer's (reformulated) problem(4):
  Levenberg-Marquardt returned 2 in 2 iter, reason 3
  Solution: 8.925018 5.212208 3.180322
  =====
  Options info:
  0: 1.000e-003      mu
  1: 1.000e-015     epsilon1 ||J^T e||_inf
  2: 1.000e-015     epsilon2 ||Dp||_2
  3: 1.000e-020     epsilon3 ||e||_2
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  3: 1.766e-001      ||Dp||_2
  4: 1.823e-003      mu/max[J^T J]_ii
  5: 2              # iterations
  6: 3              reason for terminating
  7: 6              # function evaluations
  8: 1              # Jacobian evaluations
  9: 2              # linear systems solved, i.e. # attempts for reducing error
  =====
  Termination reason: 3 - stopped by itmax
  Covariance of the fit :
  +1.509333e+06 -1.072956e+05 -4.214498e+04
  -1.072956e+05 +7.629253e+03 +2.998183e+03
  =====
  LevMar 4 10.log
  Jacob: Yes, Box: No
  =====
  ==> Results for Meyer's (reformulated) problem(4):
  Levenberg-Marquardt returned 2 in 2 iter, reason 3
  Solution: 8.928786 4.919897 2.949614
  =====
  Options info:
  0: 1.000e-003      mu
  1: 1.000e-015     epsilon1 ||J^T e||_inf
  2: 1.000e-015     epsilon2 ||Dp||_2
  3: 1.000e-020     epsilon3 ||e||_2
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  Jacob: Yes, Box: Yes
  Low Bounds: +1 +1 +1
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  1: 9.015e+002      ||e||_2
  2: 3.645e+003      ||J^T e||_inf
  3: 1.766e-001      ||Dp||_2
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  4: 1.823e-003      mu/max[J^T J]_ii
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  +1.509333e+06 -1.072956e+05 -4.214498e+04
  -1.072956e+05 +7.629253e+03 +2.998183e+03
  =====
  
```

OT@MSU 09/04/2020

```
//-----
// 14.12.11 01/09/20
// d_Optics_fit dialog : DONE!
// d_Data_fitMinimization : redesign 100%, connection 75%
```

Optics fit
✕

**Blocks with parameters to vary**

- #01-q Position@005: Q017TA
- #02-q Position@007: Q019TB
- #03-q Position@010: Q021TC
- #04-q Position@016: Q031TA
- #05-q Position@018: Q033TB
- #06-q Position@020: Q035TC
- #07-q Position@029: Q039TA
- #08-q Position@031: Q041TB
- #09-q Position@033: Q043TC
- #10-q Position@039: Q053TA
- #11-q Position@041: Q055TB
- #12-q Position@043: Q057TC
- #13-q Position@053: Q062TA
- #14-q Position@055: Q064TB
- #15-q Position@057: Q066TC
- #16-q Position@063: Q076TA
- #17-q Position@065: Q078TB
- #18-q Position@067: Q080TC
- #19-q Position@074: Q084TA
- #20-q Position@076: Q086TB

**Active Constraint blocks**

- #01 @008: s R < 100 Fit z19R
- #02 @012: s Y < 45 D1-Y
- #03 @014: s X < 100 D1-X
- #04 @022: R12 = 0 I1-focX
- #05 @023: R34 = 0 I1-focY
- #06 @024: R26 = 0 I1-AD
- #07 @035: s Y < 45 D2-Y
- #08 @037: s X < 100 D2-X
- #09 @045: R12 = 0 I2-focX
- #10 @046: R34 = 0 I2-focY
- #11 @047: R26 = 0 I2-AD
- #12 @059: s Y < 45 D3-Y
- #13 @061: s X < 100 I3-X
- #14 @069: R12 = 0 I3-focX
- #15 @070: R34 = 0 I3-focY
- #16 @071: R26 = 0 I3-AD
- #17 @080: s Y < 45 D4-Y
- #18 @082: s X < 100 D4-X
- #19 @093: R12 = 0 FP-focX
- #20 @094: R34 = 0 FP-focY

N iter = 10

**FIT**

Restore previous value

**Exit**

**Help**

Optics Settings (fast editing)

Show initial conditions

Beam Sigma Edit [#2]

Fit Options

Browse output file

Matrix Plot

Beam Sigma Plot [#2]

e\_A1900\_LISE\_2018.fit

c:/LISEcute/\_install/results/e\_A1900\_LISE\_2018.fit
Save As Print

chi2: Initial 0.0118576 and Final 0.00170461 LISE fit reduced values  
 chil: Initial 0.501378 and Final 0.0373305 LISE fit reduced values

Parameters:	LeftBound	Initial	RightBound	Final
#01-q: Q017TA	-1.0e+099	< +1.048e+001	< +1.0e+099	+1.047e+001
#02-q: Q019TB	-2.0e+001	< -9.768e+000	< +0.0e+000	-9.769e+000
#03-q: Q021TC	+0.0e+000	< +7.057e+000	< +2.0e+001	+7.060e+000
#04-q: Q031TA	+0.0e+000	< +8.590e+000	< +2.0e+001	+8.589e+000
#05-q: Q033TB	-2.0e+001	< -1.058e+001	< +0.0e+000	-1.058e+001
#06-q: Q035TC	+0.0e+000	< +9.304e+000	< +2.0e+001	+9.303e+000
#07-q: Q039TA	-1.0e+099	< +9.320e+000	< +1.0e+099	+9.320e+000
#08-q: Q041TB	-2.0e+001	< -1.045e+001	< +0.0e+000	-1.045e+001
#09-q: Q043TC	+0.0e+000	< +8.573e+000	< +2.0e+001	+8.573e+000
#10-q: Q053TA	+0.0e+000	< +8.009e+000	< +2.0e+001	+8.009e+000
#11-q: Q055TB	-2.0e+001	< -1.063e+001	< +0.0e+000	-1.063e+001
#12-q: Q057TC	+0.0e+000	< +9.655e+000	< +1.0e+001	+9.655e+000
#13-q: Q062TA	+0.0e+000	< +9.661e+000	< +2.0e+001	+9.661e+000
#14-q: Q064TB	-2.0e+001	< -1.064e+001	< +0.0e+000	-1.064e+001
#15-q: Q066TC	+0.0e+000	< +8.009e+000	< +2.0e+001	+8.009e+000
#16-q: Q076TA	+0.0e+000	< +8.573e+000	< +2.0e+001	+8.573e+000
#17-q: Q078TB	-2.0e+001	< -1.044e+001	< +0.0e+000	-1.044e+001
#18-q: Q080TC	+0.0e+000	< +9.310e+000	< +2.0e+001	+9.310e+000
#19-q: Q084TA	+0.0e+000	< +9.122e+000	< +2.0e+001	+9.122e+000
#20-q: Q086TB	-2.0e+001	< -1.013e+001	< +0.0e+000	-1.013e+001
#21-q: Q088TC	+0.0e+000	< +8.261e+000	< +2.0e+001	+8.261e+000
#22-q: Q098TA	+0.0e+000	< +7.670e+000	< +2.0e+001	+7.670e+000
#23-q: Q100TB	-2.0e+001	< -8.789e+000	< +0.0e+000	-8.789e+000
#24-q: Q102TC	+0.0e+000	< +4.213e+000	< +1.0e+001	+4.213e+000

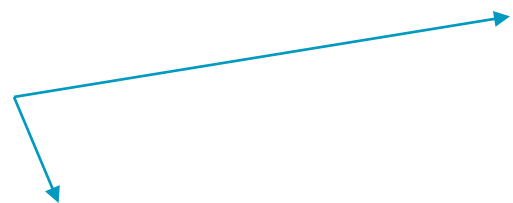
---

Constraint values:

	Initial	Final	Precision	(Fin-Des)/P	Desired
#01: Fit z19R	+9.749e+001	+9.748e+001	1.0e-001	+8.054e-004	< 100
#02: D1-Y	+3.983e+001	+3.979e+001	1.0e-001	+5.459e-005	< 45
#03: D1-X	+7.136e+001	+7.141e+001	1.0e-001	0	< 100
#04: I1-focX	-9.199e-006	-5.261e-007	1.0e-004	+5.261e-003	= 0
#05: I1-focY	-8.766e-005	-8.921e-005	1.0e-002	+8.921e-003	= 0
#06: I1-AD	-7.583e-005	-9.766e-007	1.0e+000	+9.766e-007	= 0
#07: D2-Y	+3.093e+001	+3.099e+001	1.0e+000	0	< 45
#08: D2-X	+7.795e+001	+7.799e+001	1.0e+000	0	< 100
#09: I2-focX	+3.369e-006	+1.124e-007	1.0e-003	+1.124e-004	= 0
#10: I2-focY	-1.004e-004	-1.037e-004	1.0e-002	+1.037e-002	= 0
#11: I2-AD	-1.839e-005	-2.014e-006	1.0e-001	+2.014e-005	= 0
#12: D3-Y	+3.033e+001	+3.038e+001	1.0e+000	0	< 45
#13: I3-X	+7.025e+001	+7.030e+001	1.0e-001	0	< 100
#14: I3-focX	-3.677e-006	-1.694e-007	1.0e+000	+1.694e-007	= 0
#15: I3-focY	-8.288e-005	-9.322e-005	1.0e-002	+9.322e-003	= 0
#16: I3-AD	-2.497e-005	+1.122e-006	1.0e-002	+1.122e-004	= 0
#17: D4-Y	+3.718e+001	+3.724e+001	1.0e+000	+4.260e-007	< 45
#18: D4-X	+7.006e+001	+7.012e+001	1.0e+000	0	< 100
#19: FP-focX	-4.300e-006	+3.913e-007	1.0e-003	+3.913e-004	= 0
#20: FP-focY	-1.627e-004	-2.108e-004	5.0e-001	+4.217e-004	= 0

//-----  
 // 14.12.12 09/02/20  
 // Revision: Bunch of different changes by Ksenia (~30 files)  
 // correction in d\_Range\_optimizer because of crash  
 // Implementation files c\_Graph2.\*, c\_Graph\_cm, c\_Graph\_tool  
 // c\_Plot\_util, c\_Plot\_2, c\_Plot\_rgd, c\_Plot\_spectr  
 // from Borland to Qt

// **d\_Data\_fitMinimization : DONE!**



### User Cross-Section analysis using the Abrasion-Ablation model : MINIMIZATION

This utility can be used if

- "Projectile Fragmentation" reaction mode is selected
- Abrasion-Ablation is the selected cross-section method
- "File" cross section option is set to "on"
- There are more than 2 user cross-sections in memory for this reaction.

Make items 1-3

Local line to analyze

Change Z = 18

Calculate down to Z = 16

Universal analysis value

Analysis Value	Local		Global	
	Chi2	LoD	Chi2	LoD
weights	2	4	1	2

Correct for the number of data points used

**E\* : quadratic polynomial**

	0	1	2
<E*> - excitation energy per abraded nucleon (MeV)	0	14	0
		* d_abr	* d_abr^2

Use in Fitting process

Use Bounds constraints

Lower bound 0 10 -2

Upper bound 15 30 2

**sigma(E\*) : quadratic plnml**

	0	1	2
Sigma (standard deviation)	0	9	0
		* d_abr^(1/2)	* d_abr

Use in Fitting process

Use Bounds constraints

Lower bound 0 4 -2

Upper bound 10 20 2

AA X-sections

1 Amplitude Factor

Use in Fitting process

Use Bounds constraints

Lower bound 0.5

Upper bound 1.5

Thermalization

3 Time Coefficient

Use in Fitting process

Use Bounds constraints

Lower bound 0.1

Upper bound 10

Fitting

N iterations = 2

Fit Options

Show initial conditions

Target value = 9.85e+00

N CS points = 16(75)

Restore previous values

FIT

Analysis Log-file

Browse

a1900\_wedge\_Borland

Save Settings Load Settings Evaporation settings Prefragment excit.energy

Press "Escape" to interrupt analysis

d\_abr is the number of abraded nucleons

Make default  Ok  Cancel  Help

**Borland**

**Qt**

### User Cross-Section analysis using the Abrasion-Ablation model : MINIMIZATION

This utility can be used if

- "Projectile Fragmentation" reaction mode is selected
- Abrasion-Ablation is the selected cross-section method
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Change Z = 18

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Universal analysis value

Analysis value	Local		Global	
	Ch2	LoD	Ch2	LoD
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**E\* : quadratic polynomial**

	0	1	2
<E*> - excitation energy per abraded nucleon (MeV)	0	14	0
		* d_abr	* d_abr^2

Use in Fitting process

Use Bounds constraints

Lower bound 0 10 -2

Upper bound 15 30 2

AA X-sections

1 Amplitude factor

Use in Fitting process

Use Bounds constraints

Lower bound 0.5

Upper bound 1.5

**sigma(E\*) : quadratic plnml**

	0	1	2
Sigma (standard deviation)	0	9	0
		* d_abr^(1/2)	* d_abr

Use in Fitting process

Use Bounds constraints

Lower bound 0 4 -2

Upper bound 10 20 2

Thermalization

3 Time Coefficient

Use in Fitting process

Use Bounds constraints

Lower bound 0.1

Upper bound 10

Fitting

N iterations = 2

Fit options

Show initial conditions

Target value = 9.85e+00

N CS points = 16(75)

Restore previous values

FIT

Analysis Log-file

Browse

a1900\_wedge

Save Settings Load Settings Evaporation Settings Prefragment excit.energy

Press "Escape" to interrupt analysis

d\_abr is the number of abraded nucleons

Make default  OK  Cancel  Help



// 14.12.12 09/02/20  
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 // correction in d\_Range\_optimizer because of crash

// Implementation files c\_Graph2.\*, c\_Graph\_cm, c\_Graph\_tool  
 // c\_Plot\_util, c\_Plot\_2, c\_Plot\_rgd, c\_Plot\_spectr  
 // from Borland to Qt

// **d\_Data\_fitMinimization : DONE!**

```

c:\program files (x86)\lise\results\1900_wedge_Borland.mfit
48Ca (240.0 MeV/u) + C; **** Local line Z = 18; Last Z=16
NP=32; SE:"DB0+Ca12" Density:"auto" GeomCor:"On" Tunlg:"auto" FisBar=#1 Bar$Fac$=1.00
Modes=1010 1000 110$
No Intrin.Thermalztn; LimitTemp: No

N => Local: init=16, final=16; Total: init=75, final=75
TARGET VALUEs: Initial 9.85469 and Final 5.56211 LISE++ reduced values

Parameters:      LeftBound  Initial      RightBound | Final
1. Energy #al   +1.0e+01 < +1.4000e+01 < +3.0e+01 | +1.2324e+01
2. Sigma #al    +4.0e+00 < +9.0000e+00 < +2.0e+01 | +1.1097e+01
3. AA CS-factor +2.0e-01 < +1.0000e+00 < +1.5e+00 | +4.6505e-01

Final Excitation Energy Parameters
Energy (a0,a1,a2) : +0.0000e+00      +1.2324e+01      +0.0000e+00
Sigma (a0,a1,a2) : +0.0000e+00      +1.1097e+01      +0.0000e+00
AA CS-factor:      +4.6505e-01

Chi-name      Coef  ChiBoxI  ChiBox  Chi_calc
chi2_local    2.0   2.104    0.867   1.734
LogDif_local  4.0   0.507    0.456   1.826
chi2_total    1.0   2.559    1.322   1.322
LogDif_total  2.0   0.530    0.440   0.880

Levenberg-Marquardt returned 10.0 in 10 iter. reason 3
Termination reason: 3 - stopped by itmax

Minimization info:
0: 2.949e+01 ||e||_2 at initial p
1: 8.473e+00 ||e||_2
2: 3.246e+00 ||J^T e||_inf
3: 1.237e+00 ||Dp||_2
4: 1.274e-02 mu/max[J^T J]_ii
5: 10 # iterations
6: 3 reason for terminating
7: 62 # function evaluations
8: 10 # Jacobian evaluations
9: 10 # linear systems solved, i.e. # attempts for reducing error
  
```

```

c:\LISEcute/_install/results/a1900_wedge.mfit
48Ca (240.0 MeV/u) + C; **** Local line Z = 18; Last Z=16
NP=32; SE:"DB0+Ca12" Density:"auto" GeomCor:"On" Tunlg:"auto" FisBar=#1 Bar$Fac$=1.00
Modes=$1010 1000 110$
No Intrin.Thermalztn; LimitTemp: No

N => Local: init=16, final=16; Total: init=75, final=75
TARGET VALUEs: Initial 9.85469 and Final 5.76225 LISE++ reduced values

Parameters:      LeftBound  Initial      RightBound | Final
1. Energy #al   +1.0e+01 < +1.4000e+01 < +3.0e+01 | +1.1966e+01
2. Sigma #al    +4.0e+00 < +9.0000e+00 < +2.0e+01 | +9.1404e+00
3. AA CS-factor +2.0e-01 < +1.0000e+00 < +1.5e+00 | +5.8923e-01

Final Excitation Energy Parameters
Energy (a0,a1,a2) : +0.0000e+00      +1.1966e+01      +0.0000e+00
Sigma (a0,a1,a2) : +0.0000e+00      +9.1404e+00      +0.0000e+00
AA CS-factor:      +5.8923e-01

Chi-name      Coef  ChiBoxI  ChiBox  Chi_calc
chi2_local    2.0   2.104    0.867   1.734
LogDif_local  4.0   0.507    0.456   1.826
chi2_total    1.0   2.559    1.322   1.322
LogDif_total  2.0   0.530    0.440   0.880

Termination reason: USER BREAK after 425 evaluations!

Settings at Target Value minimum: evaluation 119, iteration 2

Minimization info:
0: 2.949e+01 ||e||_2 at initial p
1: 8.863e+000 ||e||_2
2: 2.276e+000 ||J^T e||_inf
3: 0.000e+000 ||Dp||_2
4: 9.504e-004 mu/max[J^T J]_ii
5: 10 # iterations
6: 3 reason for terminating
7: 1757 # function evaluations
  
```

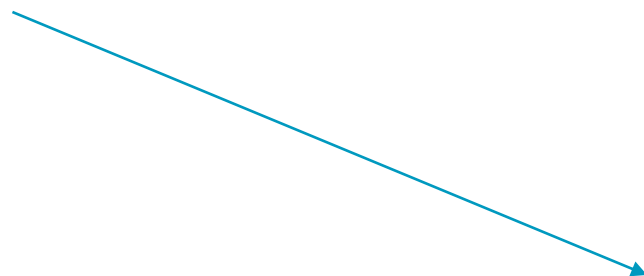
```
//-----
// 14.12.13 09/03/20

// correction of files (Icons, numberKillZero, and so on)

// Update of c_Plot\*. * files to Qt

// Implementation of files w_Graph.*, w_Graph_block.*, w_Graph_block2.*
// from Borland to Qt

// d_About : redesign 100%, connection 30%
```



```
//-----  
// 14.12.14 09/04/20  
// d_Fission_barrier : 2 plots connected!  
  
// Implementation of files w_Graph_charges.cpp,  
// w_Graph_E, w_Graph_second, w_Graph_gamma  
// from Borland to Qt
```

**57 files contains 114 Graphs (Plots)**  
(some of them even contains 3 and 4 graphs per file)  
**1 file (2 plots) have been connected to the Graph library**



09/04

	Directory	Subdirectory	Dialog	re-Design, %	Link, %	DONE	Plots total	Plots done	Bench-mark	CN_base/method	base work?	Choose initial nucleus	choose IN/works?	Borland base	Borland choose nucleus	Comments	date	size	size done	
210	w_Stuff		d_FRIB_isotopes	100	100	1	0			N/A							03/31/20	3078	3078	
211	w_Stuff		d_Password	100	100	1	0			N/A							03/31/20	2234	2234	
212	w_Stuff		d_Transmission_statistics	100	100	1	0			OT - show	Yes		No	1-create	1-create		05/28/20	60991	60991	
213	w_Stuff		d_Value_input	100	100	1				N/A							04/15/20	3401	3401	
214	w_Stuff		w_Gauge	100	100	1				N/A							03/31/20	5122	5122	
215																				
216		total		213	sum	212	99.3%											4.85E+06	4.82E+06	99.3%
217		procent			completely done	210	98.6%													

08/28

	Directory	Subdirectory	Dialog	re-Design, %	Link, %	DONE	Plots total	Plots done	Bench-mark	Comments	date	size	size done	
212	w_Stuff		d_Transmission_statistics	100	100	1	0				05/28/20	60991	60991	
213	w_Stuff		d_Value_input	100	100	1					04/15/20	3401	3401	
214	w_Stuff		w_Gauge	100	100	1					03/31/20	5122	5122	
215														
216		total		213	sum	210	98.5%					4.85E+06	4.77E+06	98.3%
217		procent			completely done	206	96.7%							

6 dialogs have been completed for this period, 3 dialogs are still left

Directory	Dialog	re-Design, %	Link, %	DONE
w_Stuff	d_About	80	30	0.3
d_Options	d_Secondary_targetStatistics	100	50	0.5
w_Bi	d_BI	100	80	0.8

## Connection files to the LISE++ Graph Library

Oleg partially on the next week: participation in the NSCL experiment and RIKEN workshop

### Example of connection (d\_Fission\_barrier)

```

//=====
void TFissionBarrierDlg::CmPlotL()
{
if(!PermitFlag)return;

char str[200];

#define n_draw 2

double xmax=qMax(Lbfis1,SELMAX)+10;
int ixmax = int(xmax+0.5);
double y1max=0, y2max=0;
int Vanish1=0;

//=====
distribution *result1[2];
distribution *result2[2];
char **str_legend=new char*[n_draw];
double *factor=new double[n_draw];

TGraph* graph = new TGraph(this, 1);
graph->show();

sprintf(str,"%s fission barrier properties", Ce->name(10));
graph->set_title(str);
graph->PatienceOn();

for(int i=0; i<n_draw; i++)
{
result1[i]=new distribution(0, ixmax, ixmax, "Barrier", "MeV");
result2[i]=new distribution(0, ixmax, ixmax, "Yrast", "MeV");
str_legend[i]=new char[50];
strcpy(str_legend[i], FisBar_name[i]);
factor[i]=1;
}
}

```

```

for(int L=0; L<=ixmax; L++)
{
double FisBar0, Yrast0, FBmax0, Yrast1;
BARFIT(Ce->A(), Ce->Z(), L, FisBar0, Yrast0, FBmax0);
FisBar0 *= opt->BarFac;
result1[0]->input_fn(L, FisBar0);

double FisBar1 = FissionBarrier(Ce, L, opt->BarFac, fb_Cohen, true);
if(FisBar1<=0 && Vanish1==0) Vanish1=L;
result1[1]->input_fn(L, FisBar1);

y1max = qMax(FisBar0, y1max);    y1max=qMax(FisBar1, y1max);

if(FisBar1>0) Yrast1 = YRAST(Ce->A(), Ce->Z(), L);
else Yrast1 = -777;           // 03/18/2015 v.9.10.44

if(Yrast0 <= 0) Yrast0 = -777;           // 03/18/2015 v.9.10.44
result2[0]->input_fn(L, Yrast0);
result2[1]->input_fn(L, Yrast1);

y2max=qMax(Yrast0, y2max);    y2max=qMax(Yrast1, y2max);
}

//=====

graph->PatienceOff();
graph->CreatePlots(2);

graph->Plots[0]->set_window(0, 1000, 500,0,1, 0, ixmax, 0,y1max+1, false);
graph->Plots[1]->set_window(500,1000,1000,0,1, 0,ixmax, 0,y2max+1, false);

graph->Plots[0]->init_distribution(2, result1, str_legend, factor, true, true,PM_INTER2,false);
graph->Plots[1]->init_distribution(2, result2, str_legend, factor, true, true,PM_INTER2,false);

const char *s1 ="Angular Momentum, hbar";
graph->Plots[0]->set_axis_title(s1, "Fission Barrier, MeV");
graph->Plots[1]->set_axis_title(s1, "Yrast, MeV");

graph->Plots[0]->set_sub_title("Fission Barrier");
graph->Plots[1]->set_sub_title("Yrast Line");
}

```

```

sprintf(str, "Barfac=%2f   Corrections [Odd-Even: \"%s\" Shell: \"%s\"]",opt->BarFac,
(opt->FisBarOddEvenCorrections == 1 ? "yes" : "no"),
(opt->FisBarShellCorrections == 1 ? "yes" : "no"));

graph->textline(str,1);

sprintf(str, "Fission barriers vanish at L=%d (BarFit) & at L=%d (FisRot)",int(SELMAX), Vanish1);
graph->textline(str,2);

//-----
for(int i=0;i<n_draw;i++)
{ delete result1[i]; delete result2[i]; delete str_legend[i]; }

delete[] str_legend;
delete[] factor;
//=====
}

```