

L_n, L_x curves

ALQ Pos. 1

T_n, T_x curves



Cutheat – TL curves



IRSLT

IRSL/BOSL = 0.88%



IRSL curve (10 s)



help("Analyse_SAR_OSLdata")

unkown measurement





Fig. 4 – Bos & Wallinga (2012)





`help("CW2pLM")`



Fig. 4 – Bos & Wallinga (2012)





Fig. 4 – Bos & Wallinga (2012)

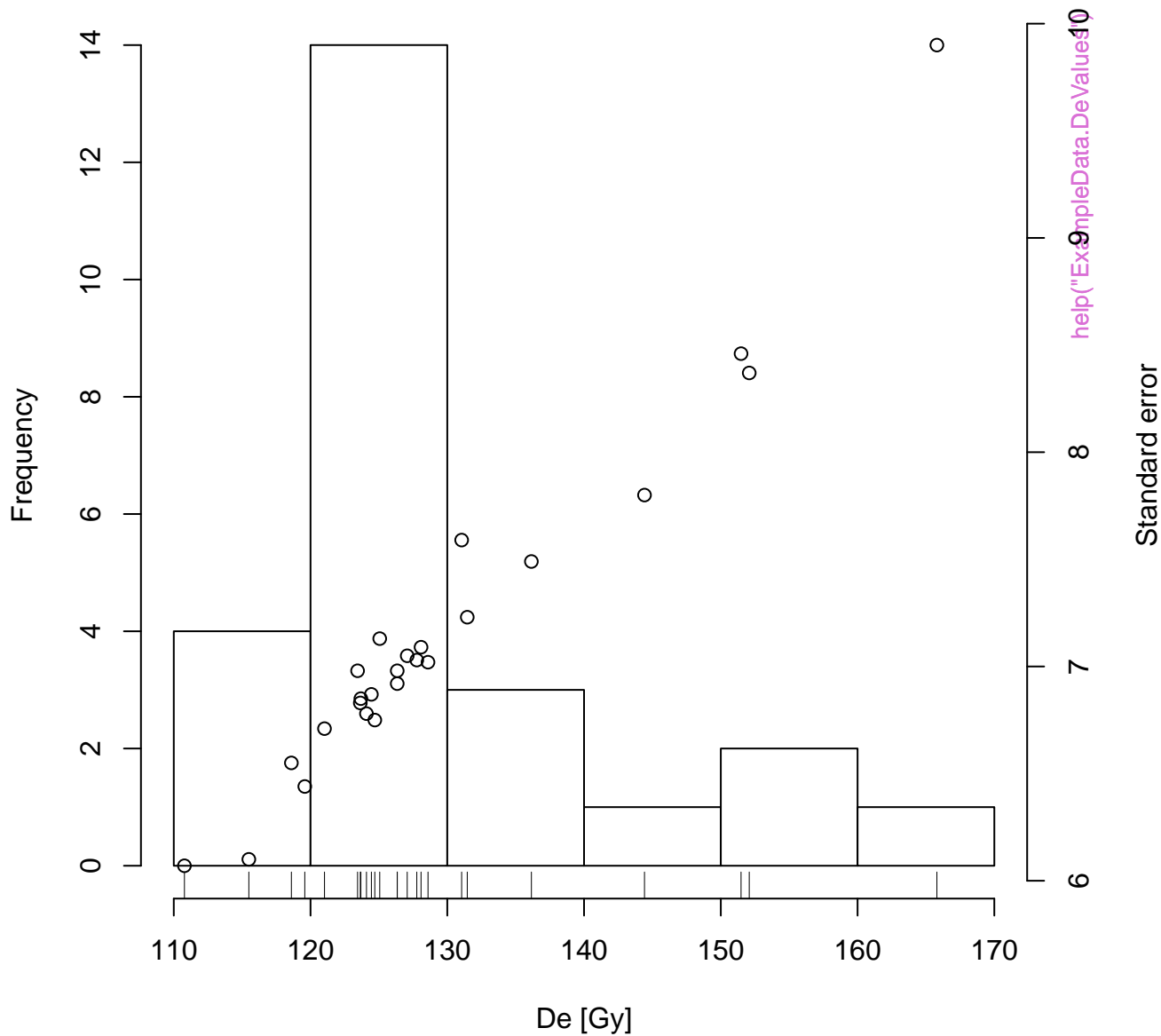




Histogram



Histogram





`help("ExampleData.FittingLM")`



`help("ExampleData.LxTxData")`



`help("ExampleData.LxTxOSLData")`



`help("ExampleData.LxTxOSLData")`

RF

#1



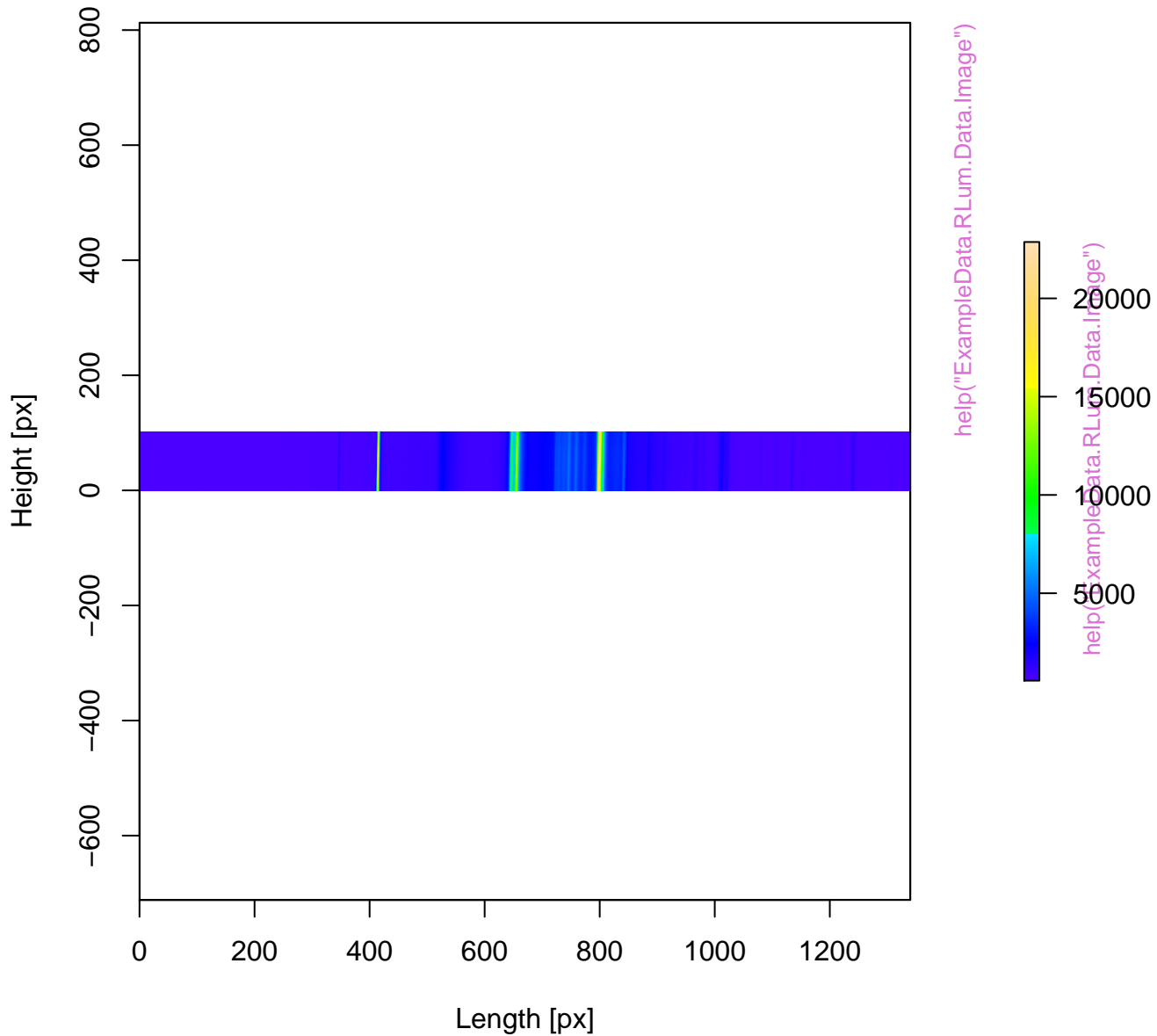
RF

#2



help("ExampleData.RLum.Analysis")

RLum.Data.Image

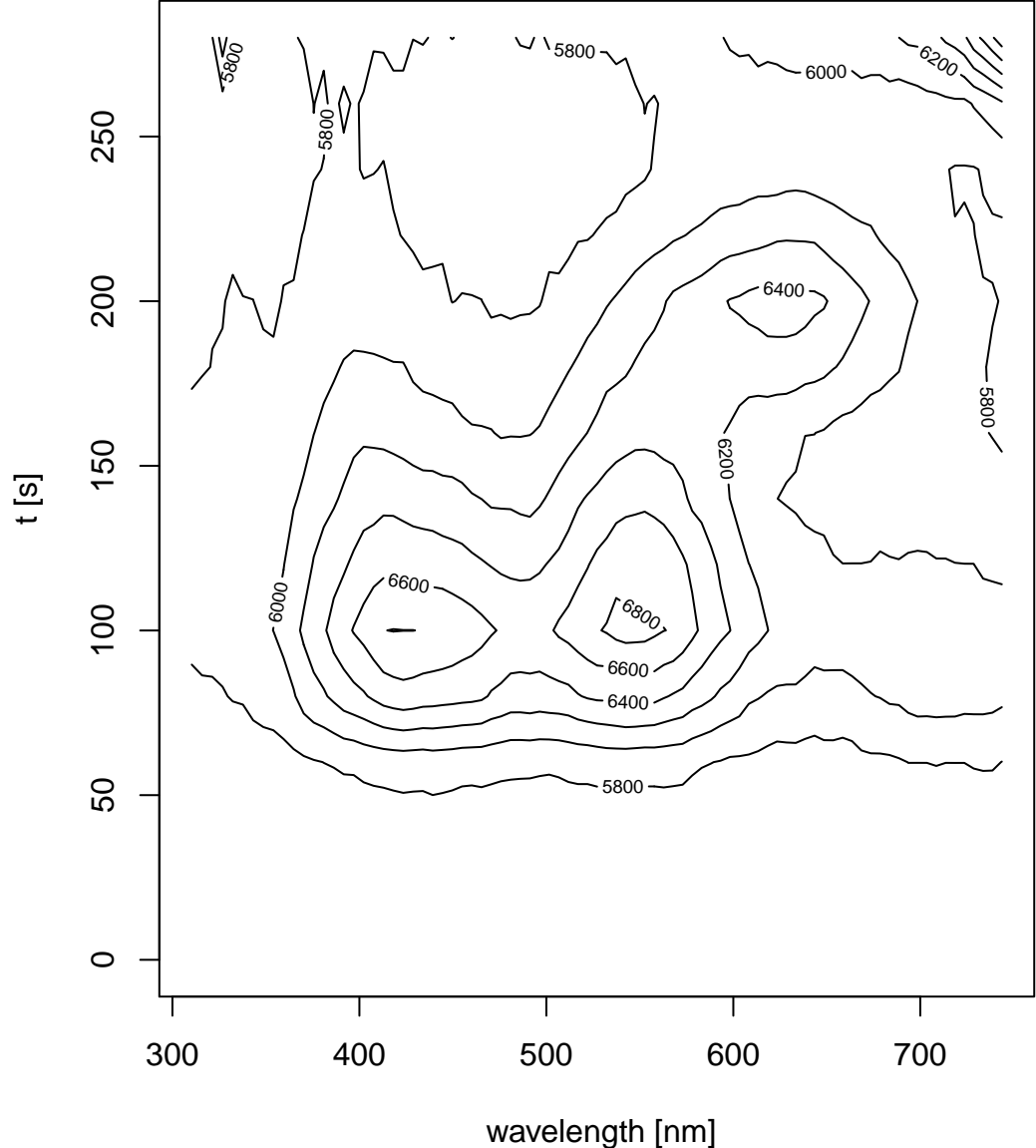


OSL (UVVIS)



help("ExampleData.XSYG")

RLum.Data.Spectrum



help("ExampleData.XSYG")

IR-RF

$D_e = 623.25$ (608.39 638.67)



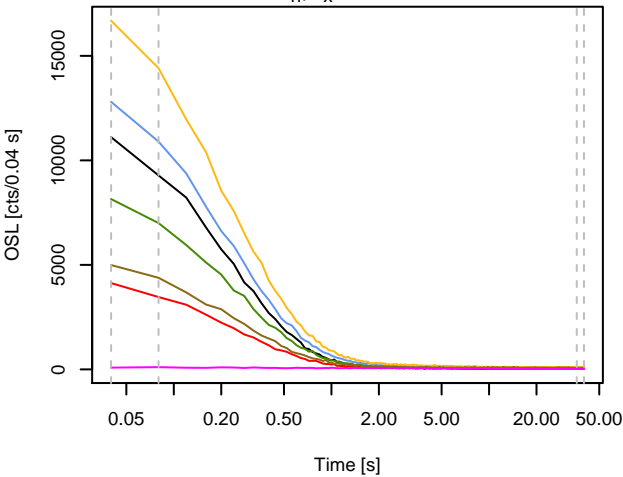
TL previous L_n, L_x curves



TL previous T_n, T_x curves



L_n, L_x curves



T_n, T_x curves



●
Natural
(0)

●
R1
(450)

●
R2
(1050)

●
R3
(2000)

●
R4
(2550)

●
R5
(450)

●
R0
(0)

Growth curve

$D_e = 1677.16 \pm 46.11$ | fit: EXP

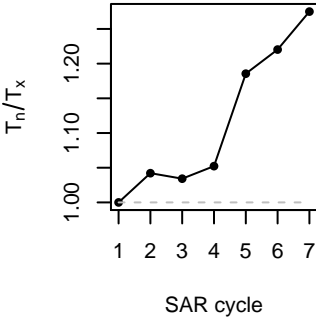


D_e from MC simulation

$D_{eMC} = 1664.49 \pm 46.11$ | quality = 99.2 %



Test dose response

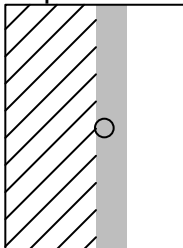


Rejection criteria

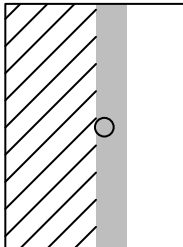
Recycling ratio



Recuperation rate

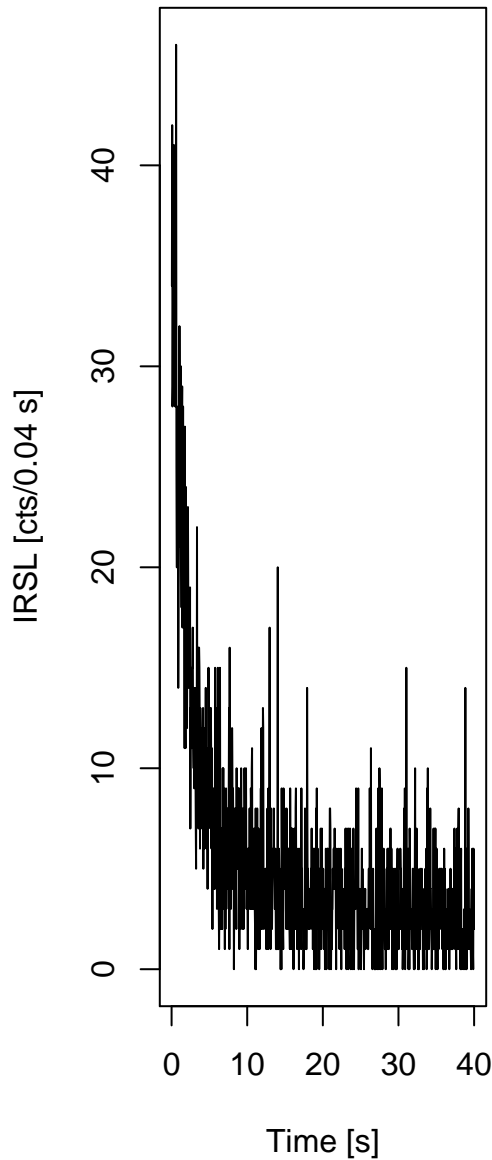


Palaeodose error



- 0.2 + 0.2

IRSL



`help("analyse_SAR.CWOSL")`

L_n, L_x curves



T_n, T_x curves



Plateau test L_n, L_x curves

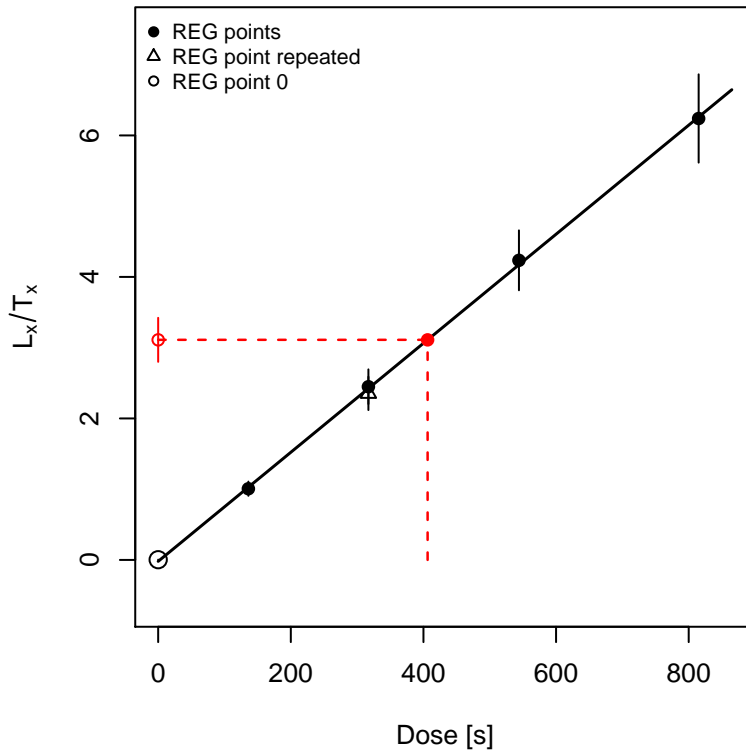


plateau Test T_n, T_x curves



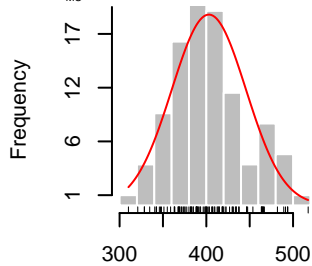
Growth curve

$D_e = 406.28 \pm 42.81$ | fit: LIN



D_e from MC simulation

$D_{eMC} = 402.95 \pm 42.81$ | quality = 99.2 %



Test dose response



Pseudo pIRIR data set based on quartz OSL

TL
pseudolRSL1
pseudolRSL2

help("analyse_pIRIRSequence")

Pseudo pIRIR data set based on quartz OSL

TL previous L_n, L_x curves



help("analyse_pIRIRSequence")

Pseudo pIRIR data set based on quartz OSL



Pseudo pIRIR data set based on quartz OSL

TL previous T_n, T_x curves



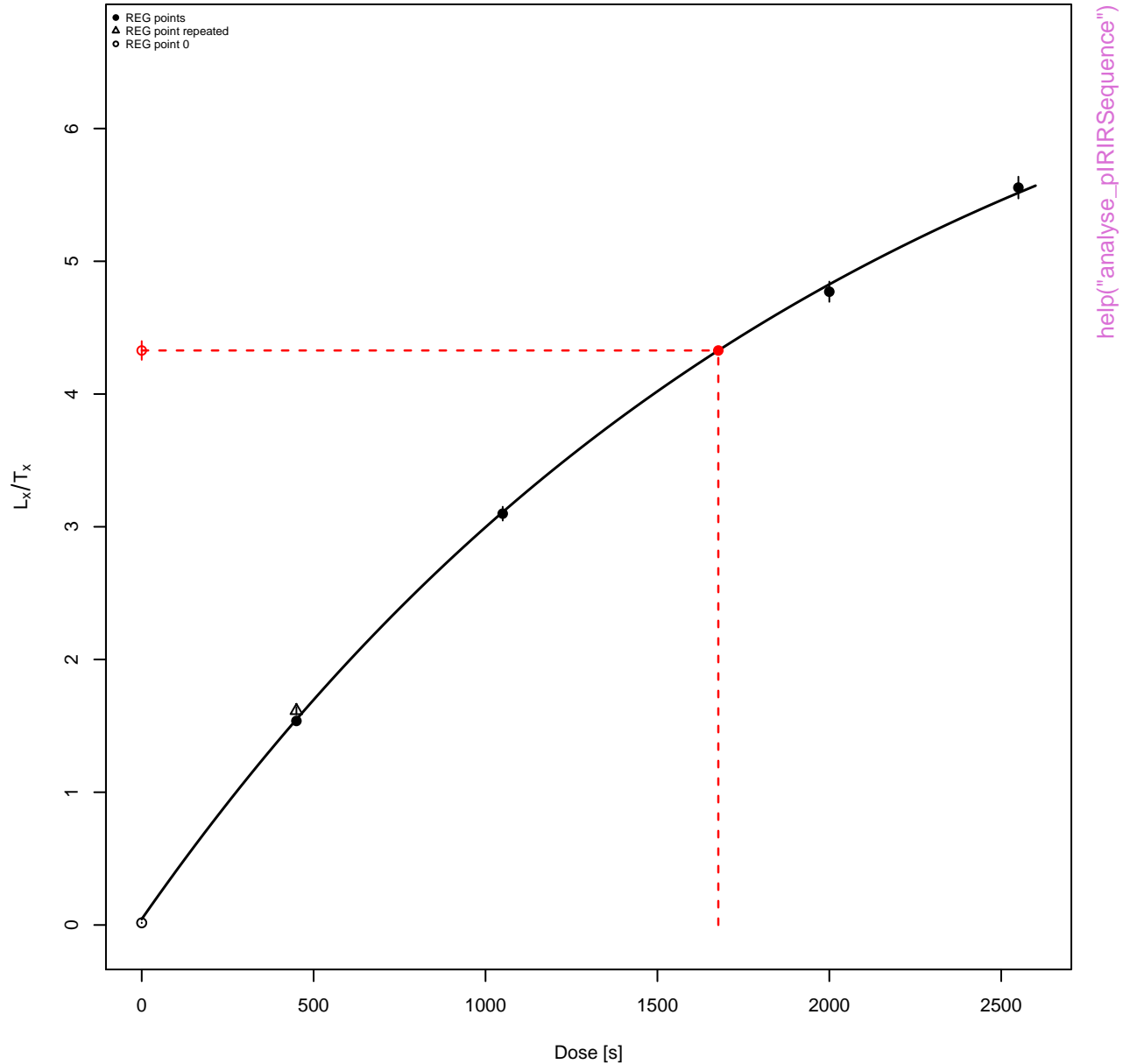
help("analyse_pIRIRSequence")

Pseudo pIRIR data set based on quartz OSL



Pseudo pIRIR data set based on quartz OSL

$D_e = 1677.16 \pm 46.11$ | fit: EXP



D_e from MC simulation

D_{MC} = 1664.49 ± 46.11 | quality = 99.2 %



help("analyse_pIRIRSequence")

Test dose response



Pseudo pIRIR data set based on quartz OSL



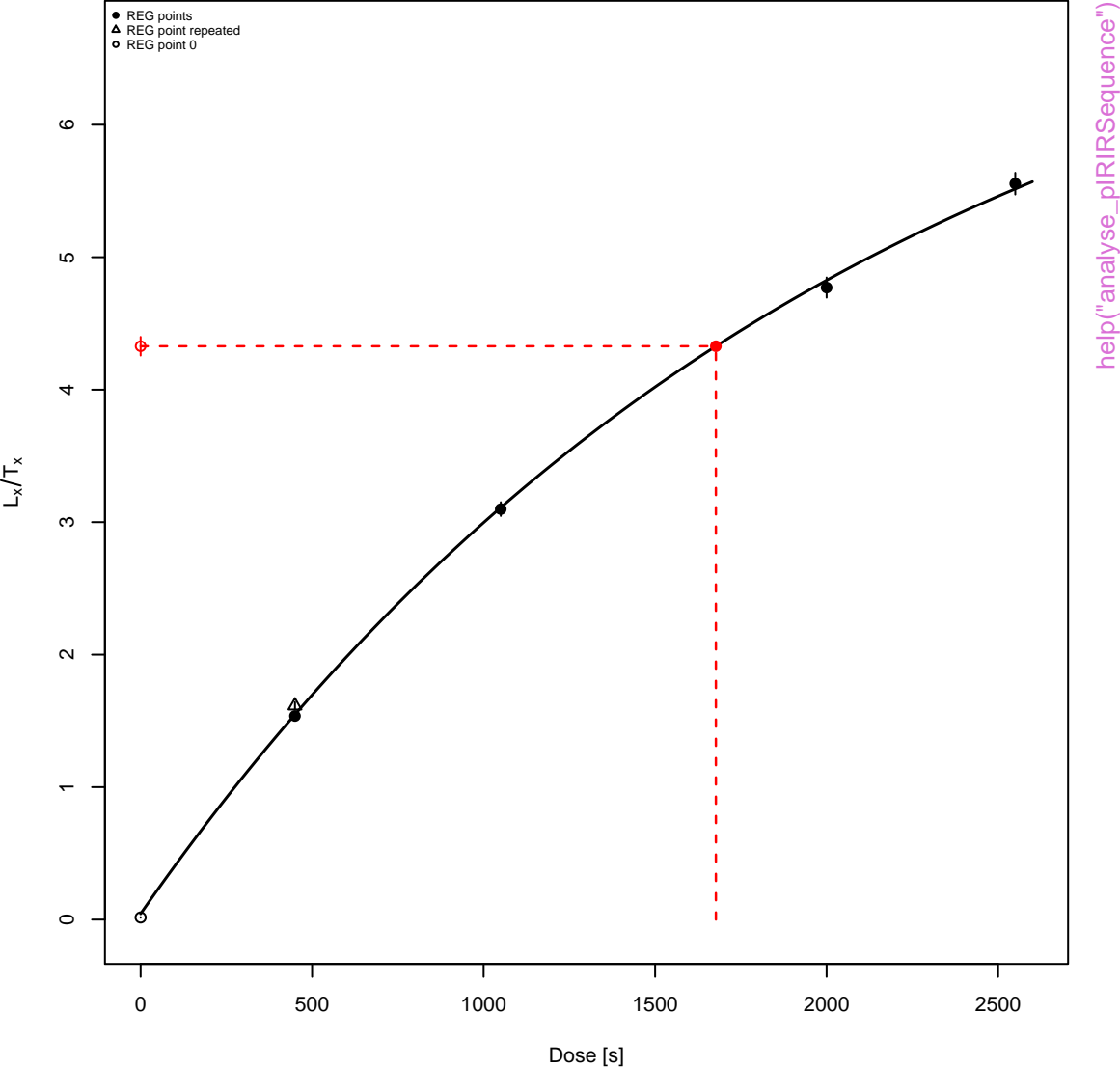
Pseudo pIRIR data set based on quartz OSL





Pseudo pIRIR data set based on quartz OSL

$D_e = 1677.16 \pm 48.13$ | fit: EXP



D_e from MC simulation

D_{e,MC} = 1663.13 ± 48.13 | quality = 99.2 %



n = 100 , valid fits = 100

help("analyse_pIRSequence")

Test dose response



Summarised growth curves



Sensitivity change

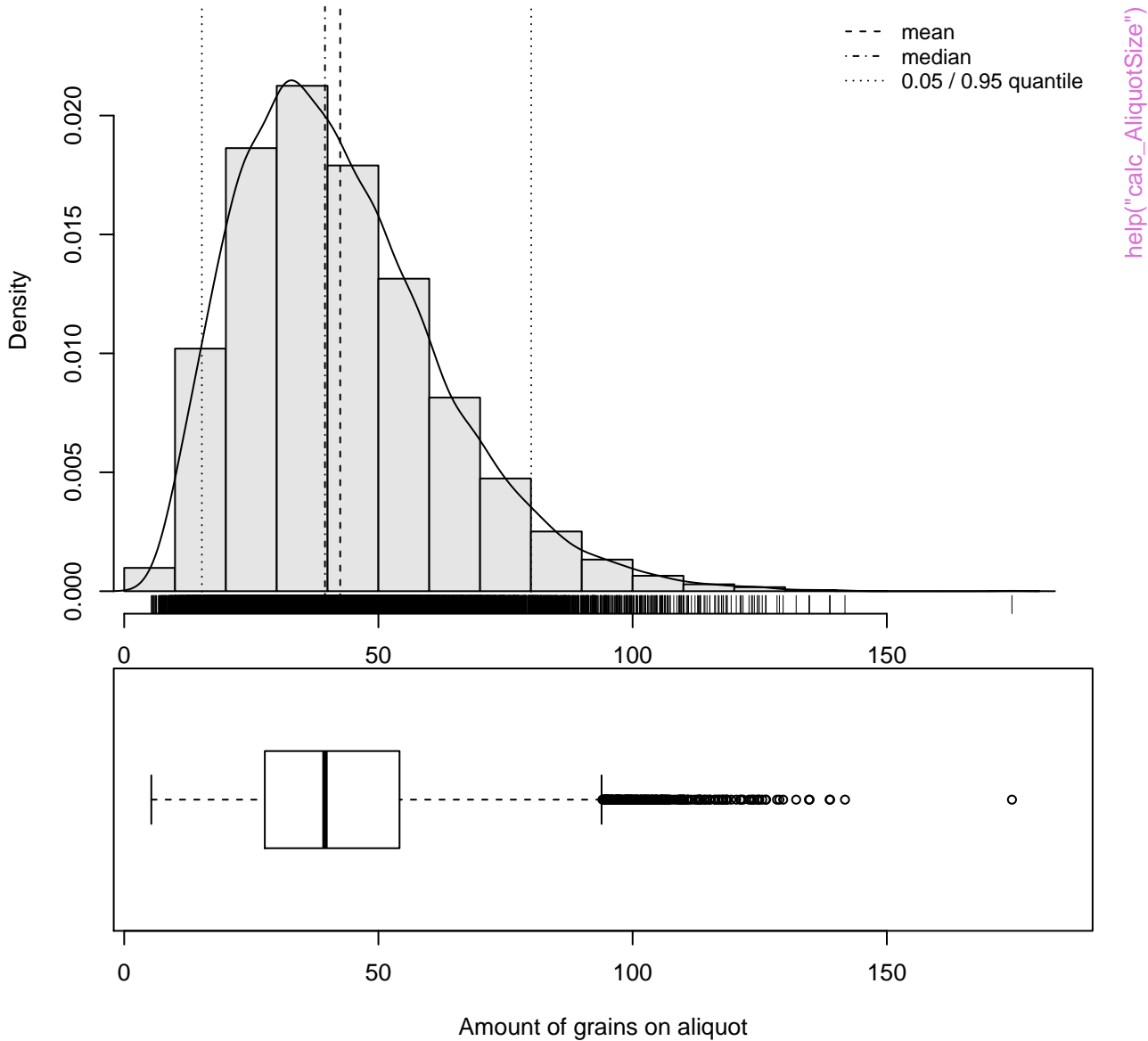


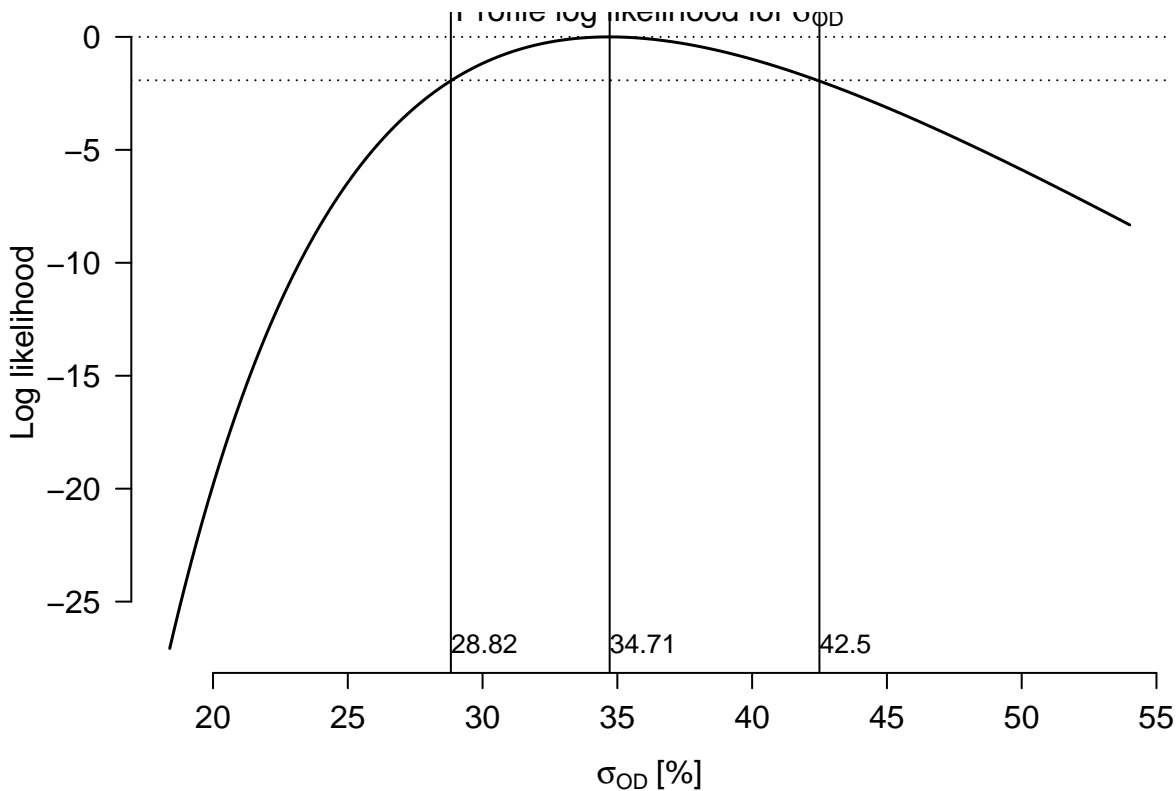
Rejection criteria



Monte Carlo Simulation

$n = 10000 \mid \hat{\mu} = 42 \mid \hat{\sigma} = 20 \mid \frac{\hat{\sigma}}{\sqrt{n}} = 0 \mid v = 0.89$





Finite Mixture Model

$\sigma_b = 0.2 \mid n = 62$

Normal distributions



Proportion of components



Statistical criteria



help("calc_FiniteMixture")

used values = 22

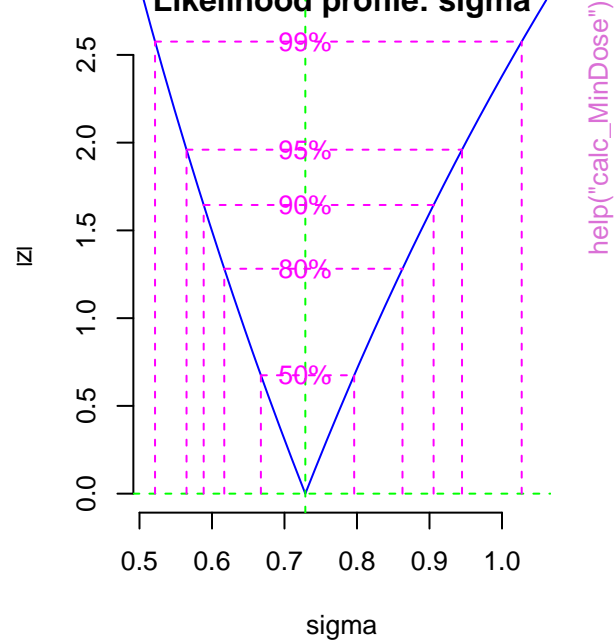












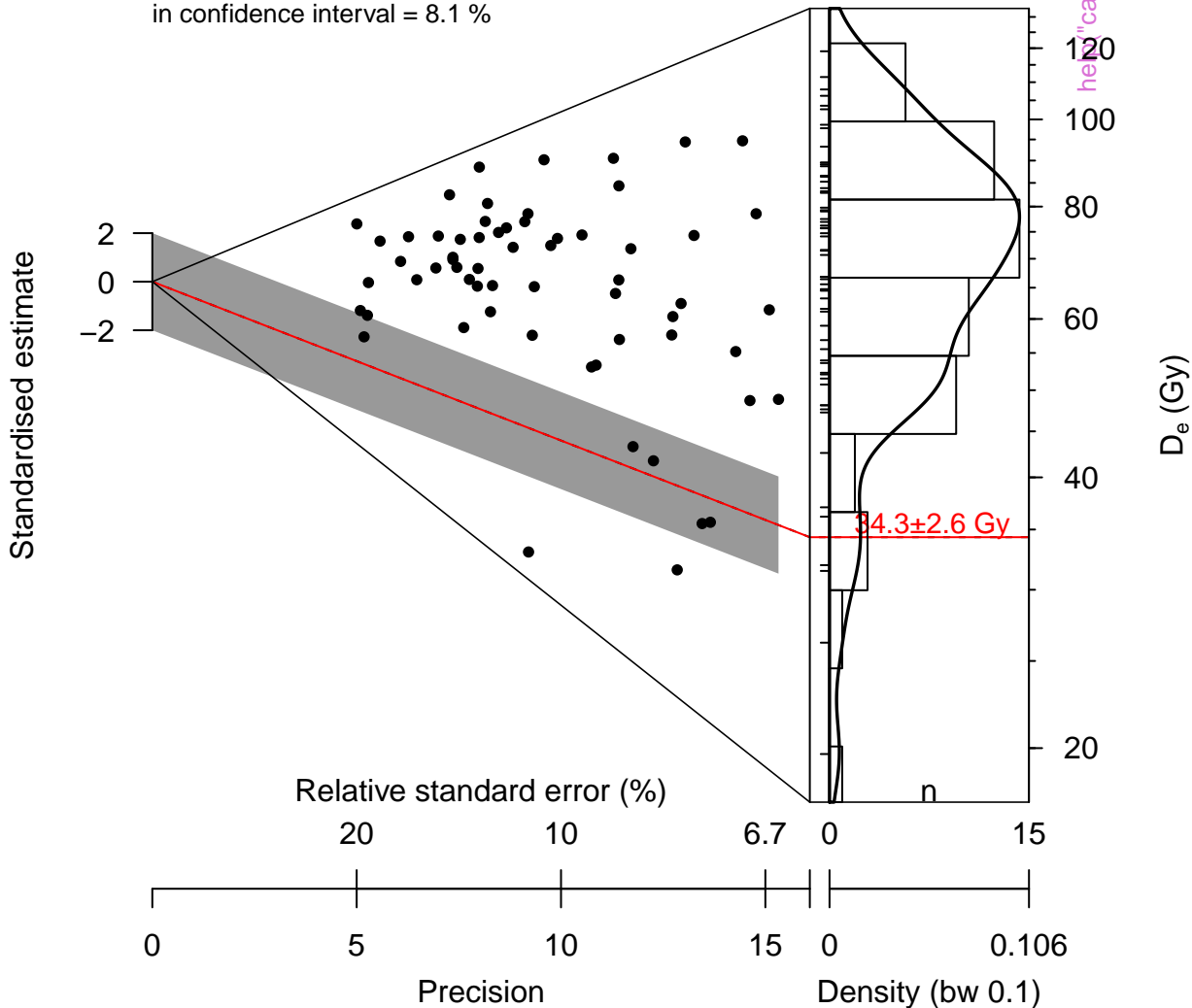
```
help("calc_MinDose")
```

n = 62

weighted mean = 59.3

median = 71.07

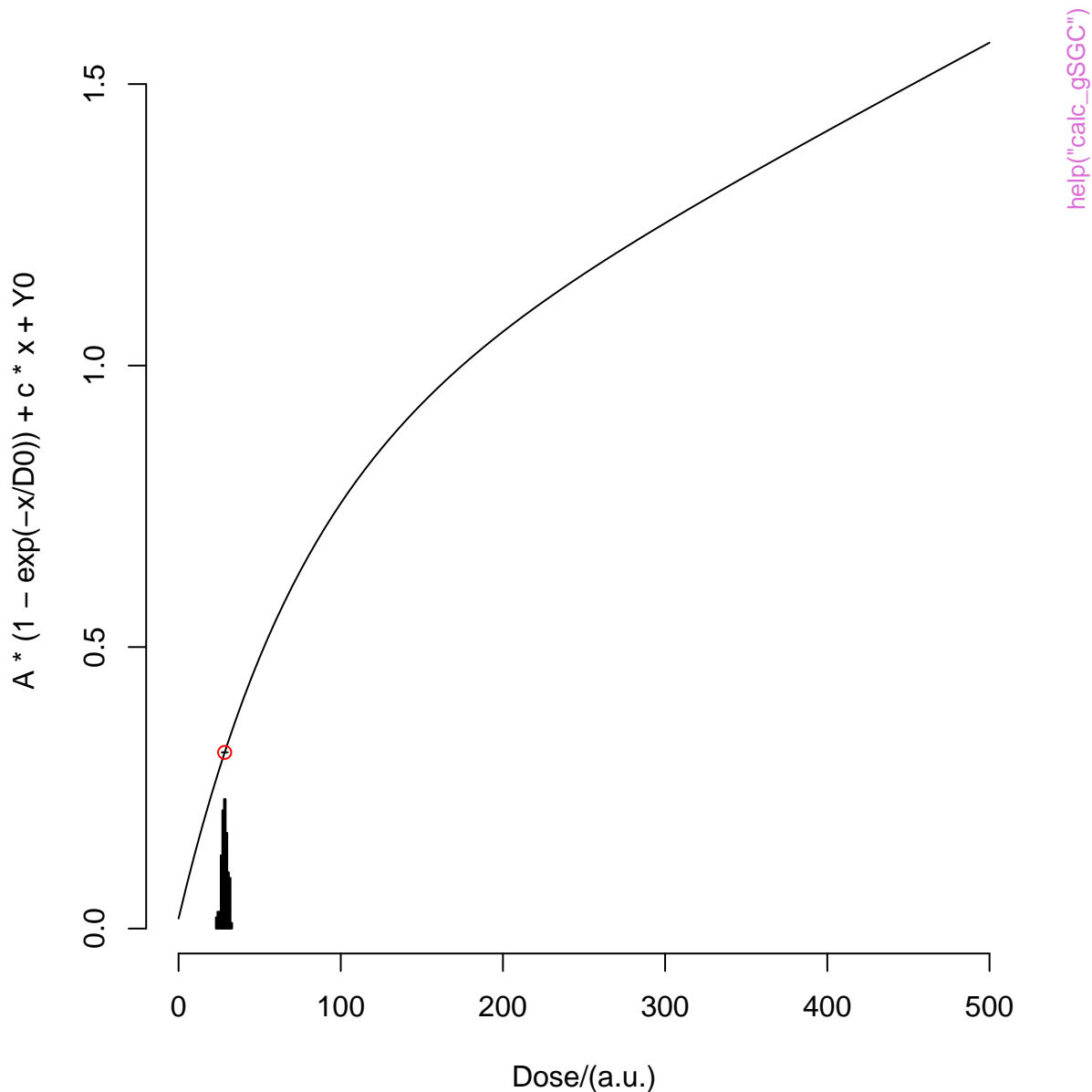
in confidence interval = 8.1 %



D_e distribution

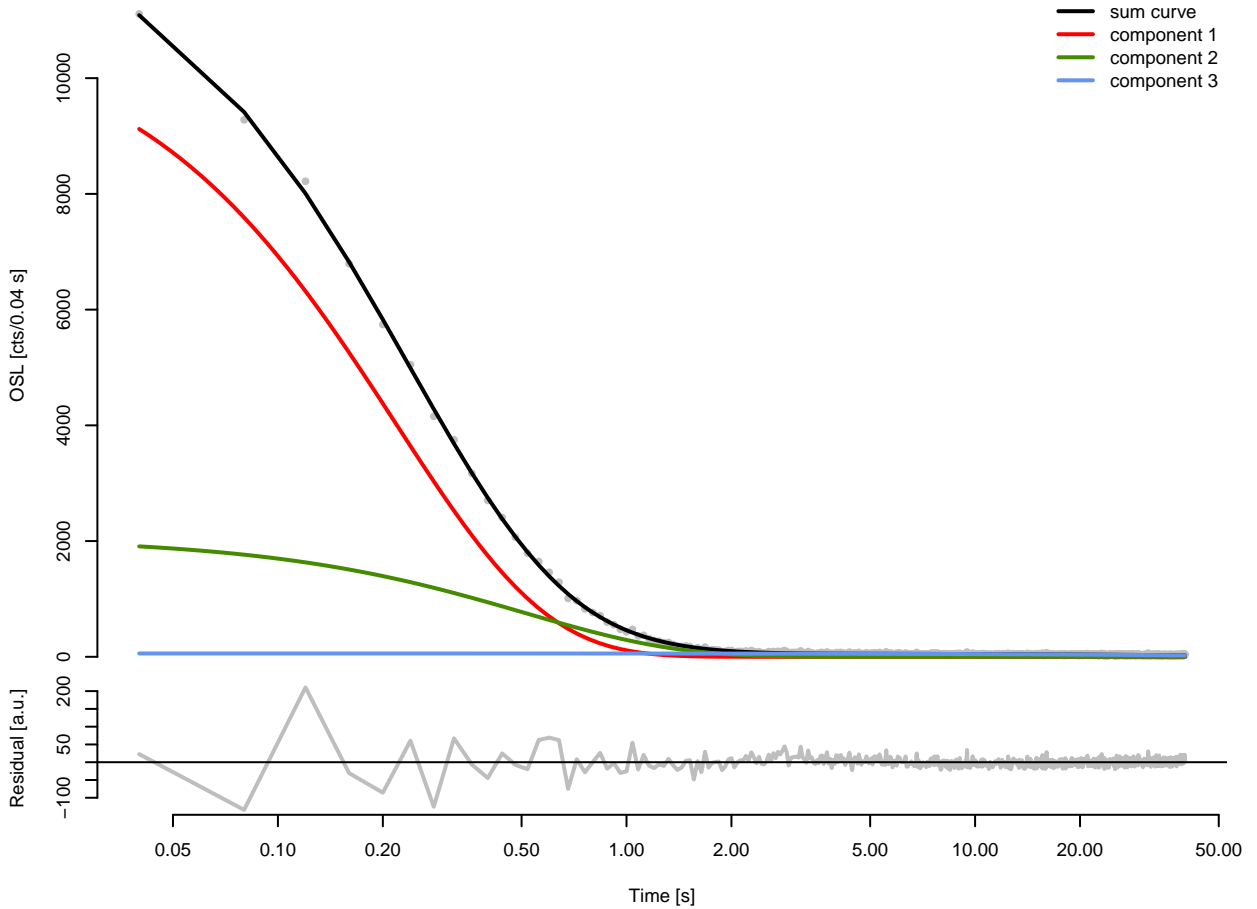


gSGC and resulting De

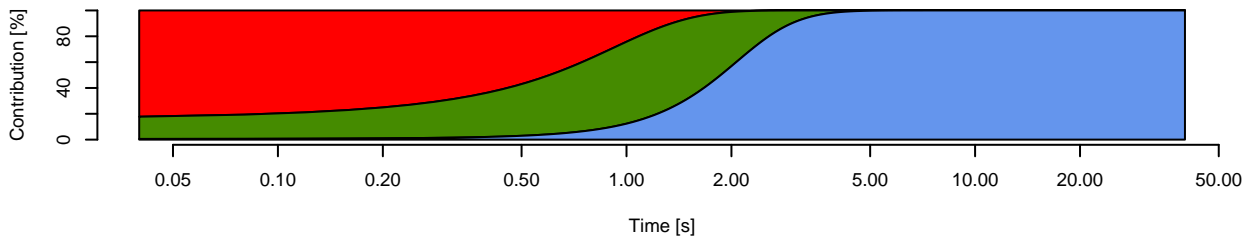


CW Curve Fit

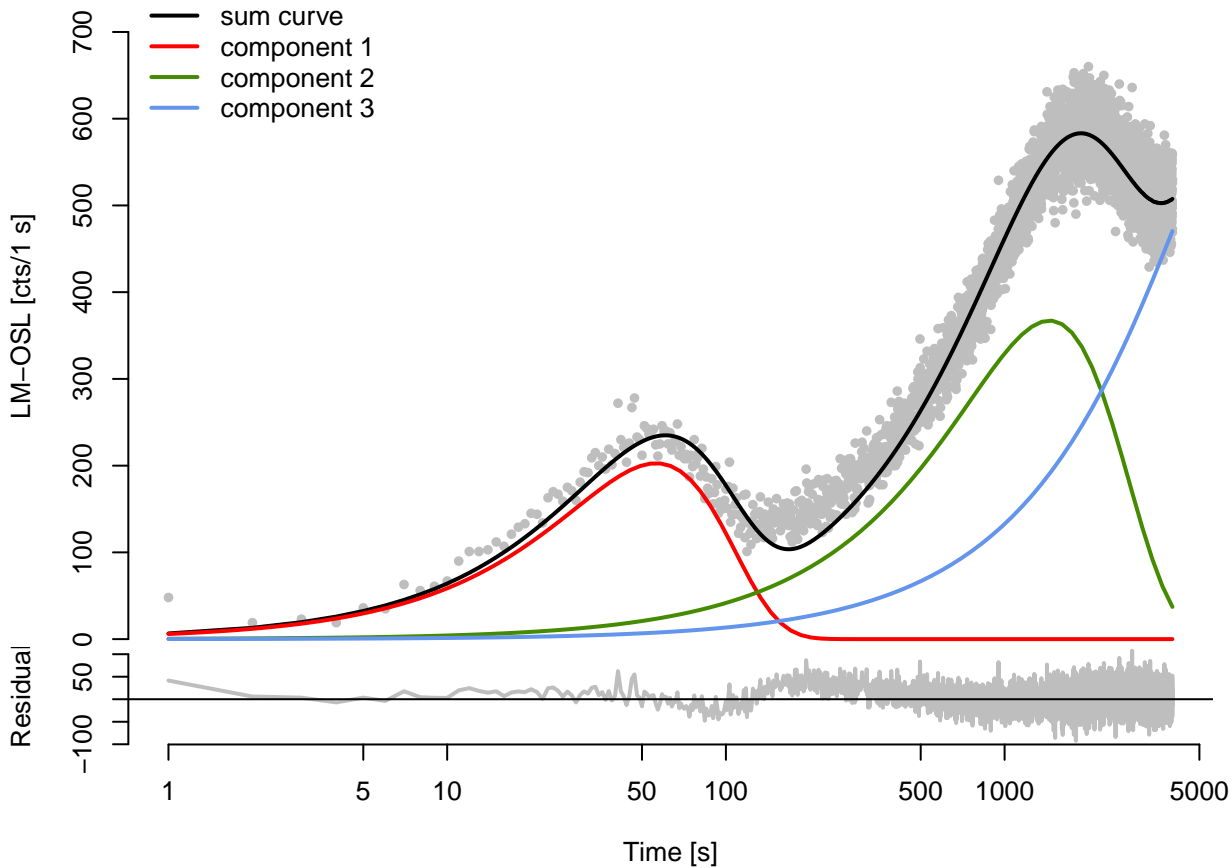
Default



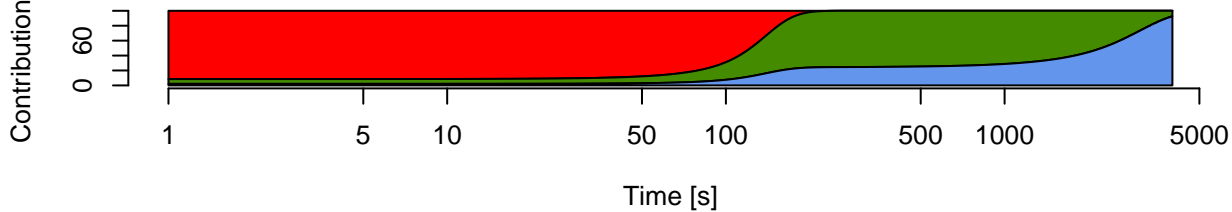
Component contribution to sum curve



Default



Component contribution to sum curve



Background



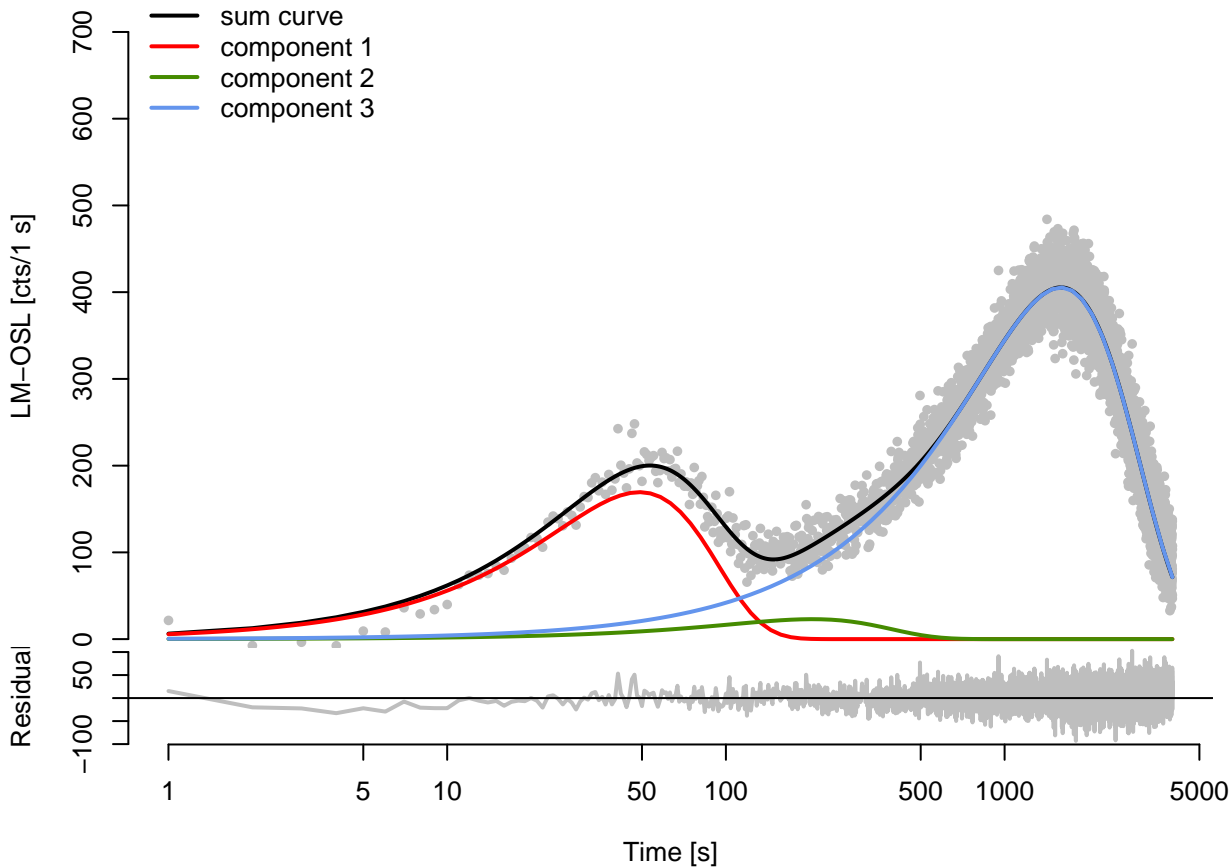
Default



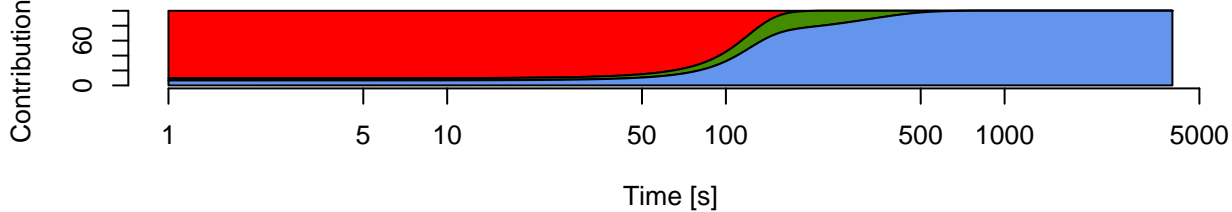
Component contribution to sum curve



Default



Component contribution to sum curve

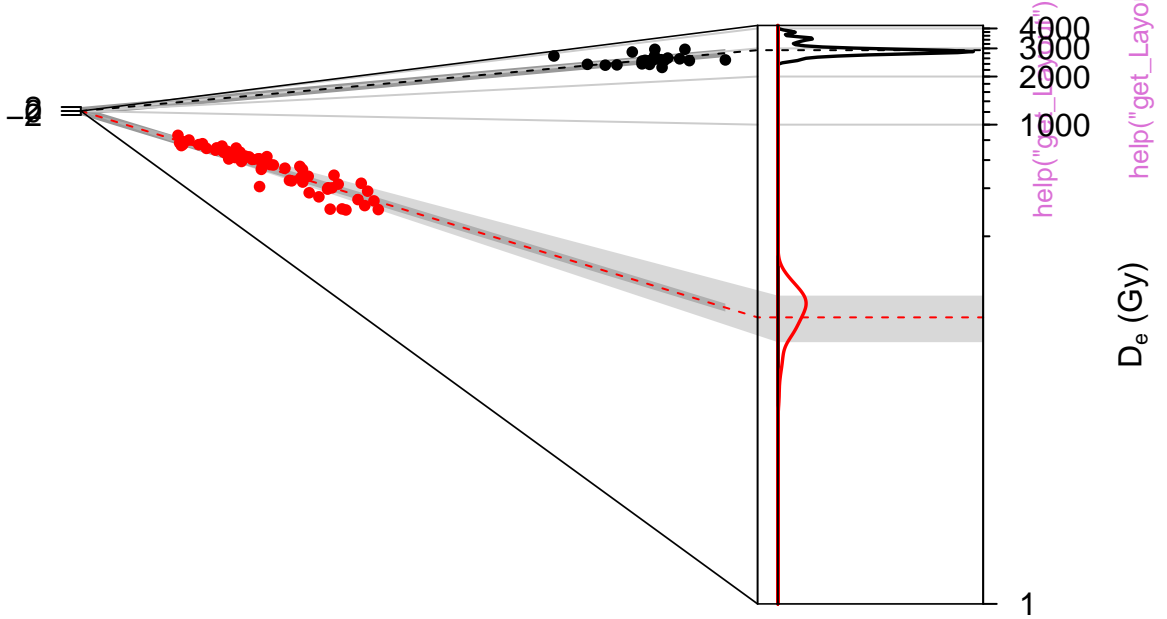


D_e distribution

n = 25 | in confidence interval = 68 %

n = 62 | in confidence interval = 41.9 %

Standardised estimate



Relative standard error (%)

10

5

3.3

0

10

20

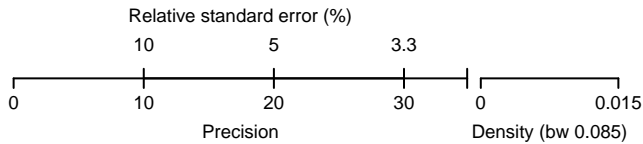
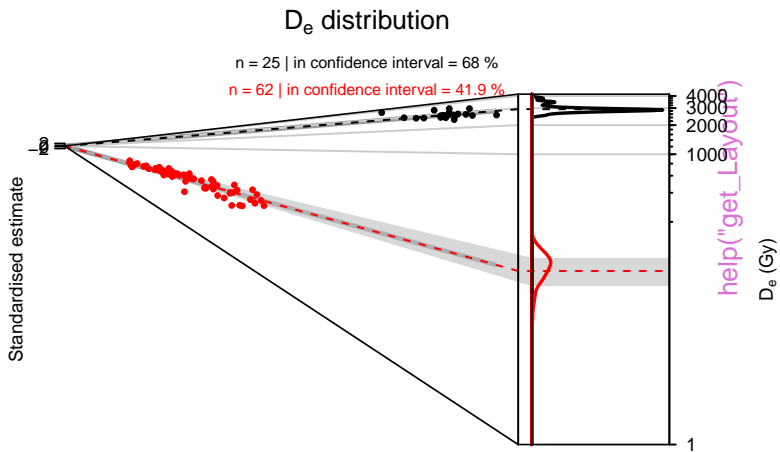
30

0

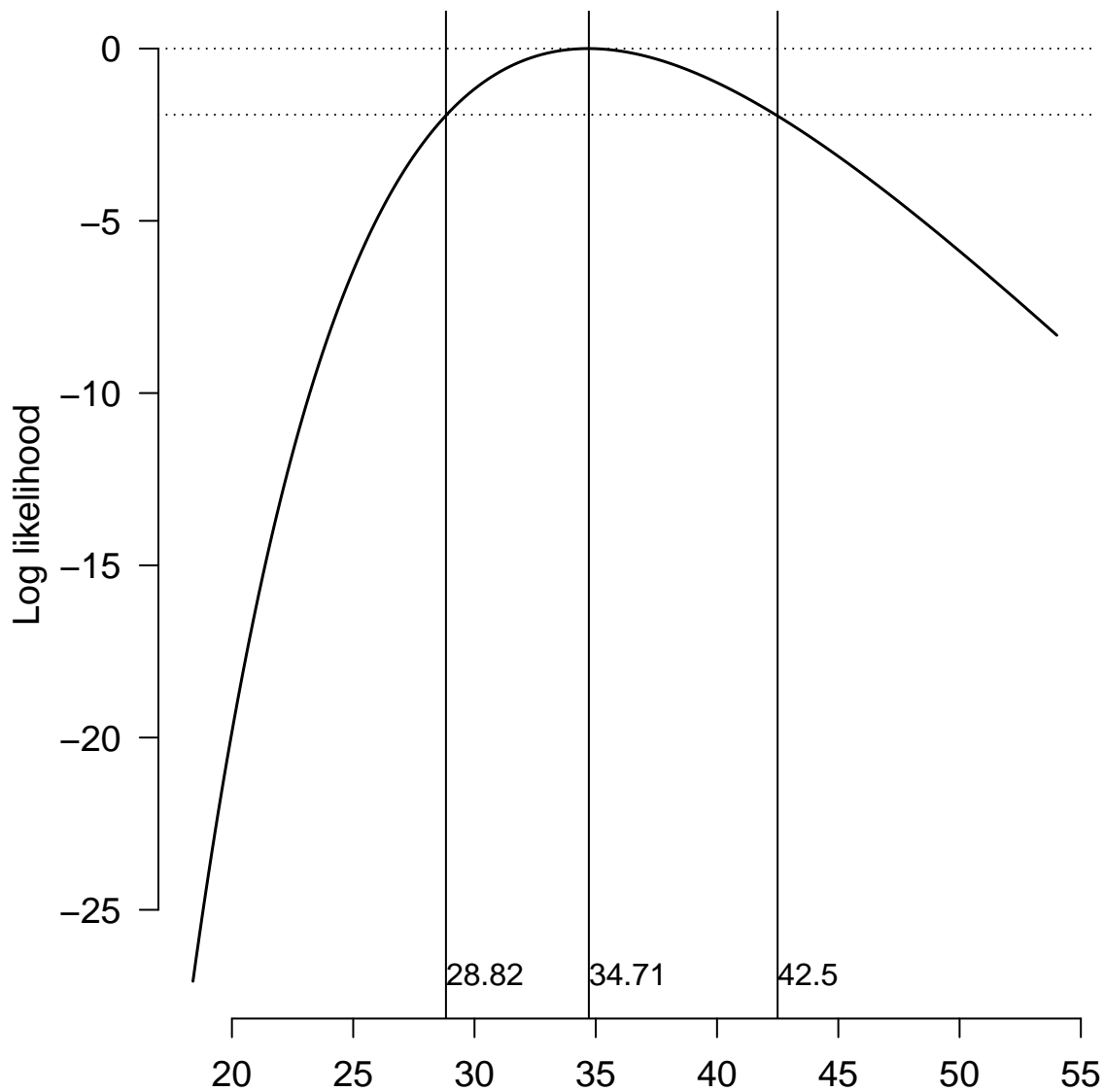
0.015

Precision

Density (bw 0.085)



Profile log likelihood for σ_{OD}

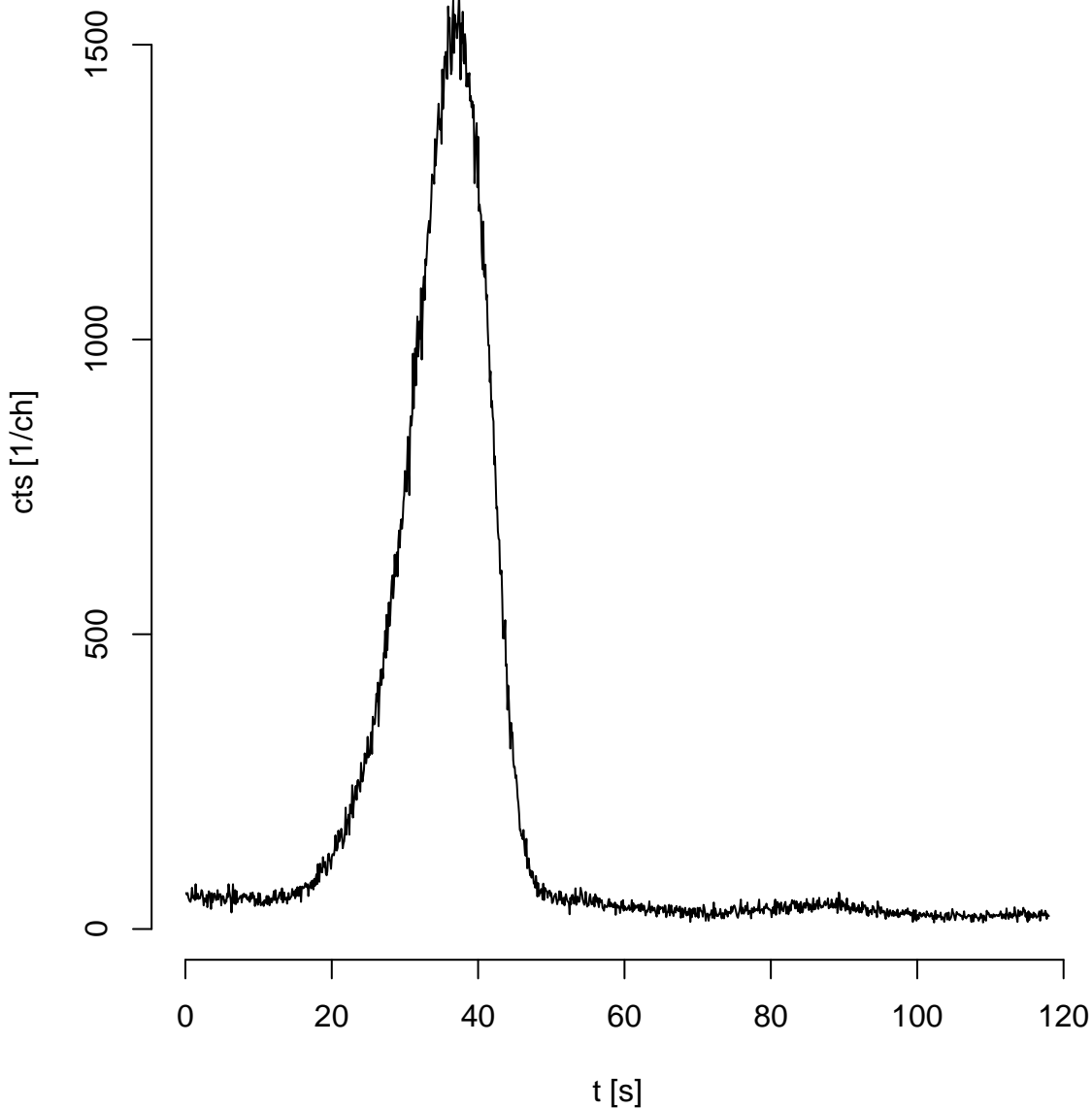


TL (UVVIS)



help("merge_RLum.Data.Curve")

TL (UVVIS)



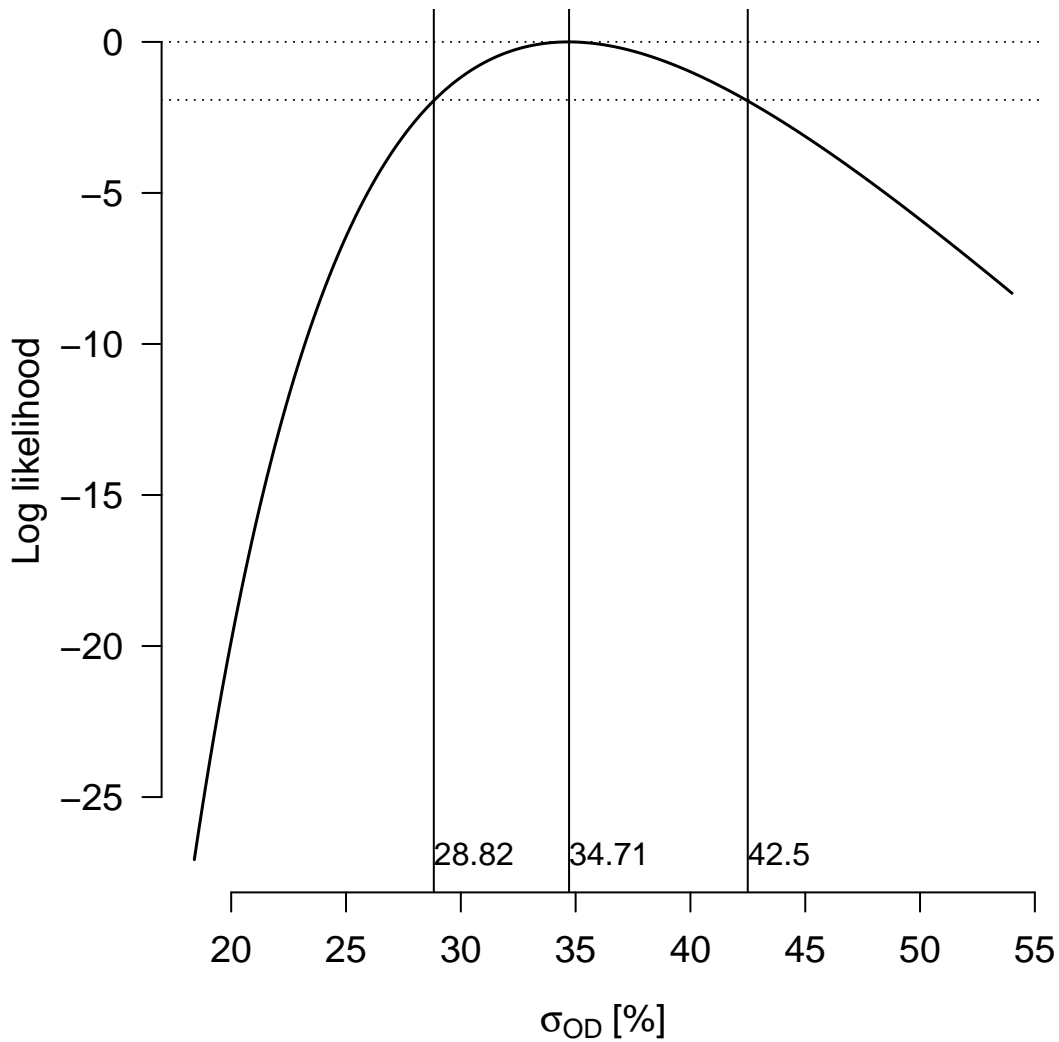
help("merge_RLum.Data.Curve")

TL (UVVIS)

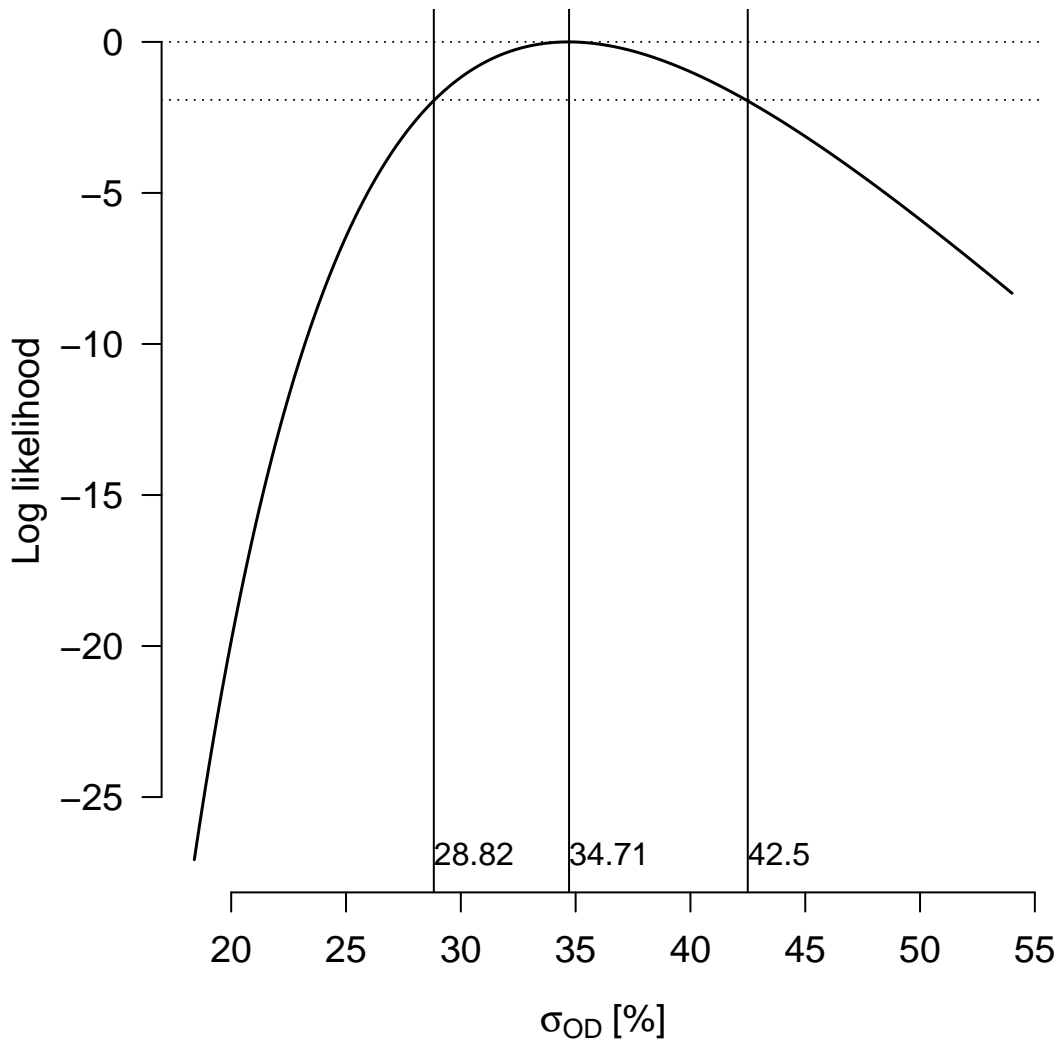


help("merge_RLum.Data.Curve")

Profile log likelihood for σ_{OD}



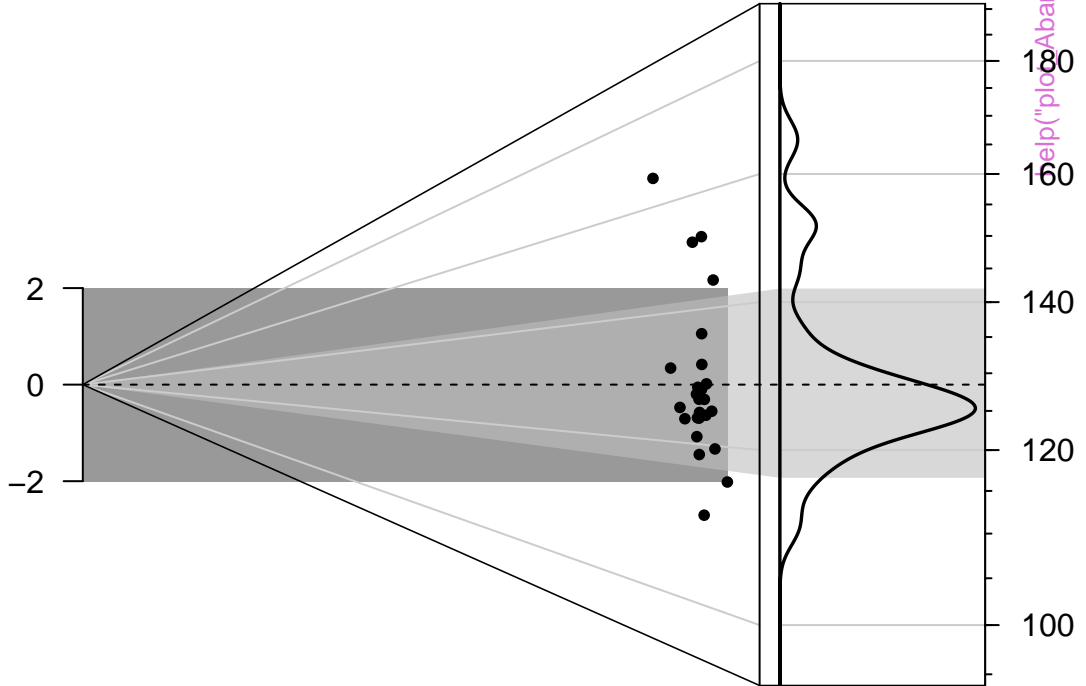
Profile log likelihood for σ_{OD}



D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



help("plot_AbanicoPlot")

help("plot_AbanicoPlot")

Relative standard error (%)

20

10

6.7

0

5

10

15

0

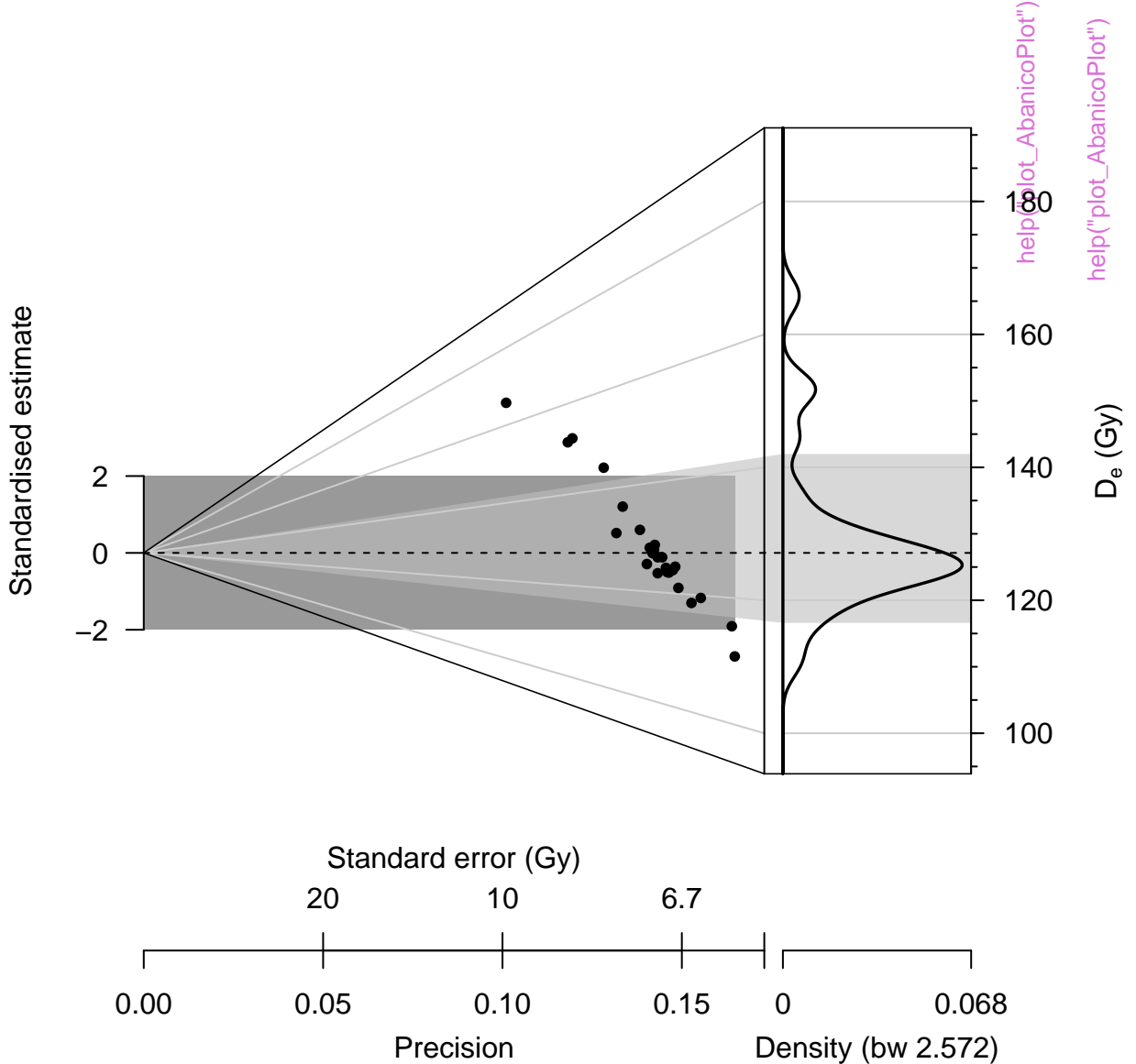
0.068

Precision

Density (bw 0.02)

D_e distribution

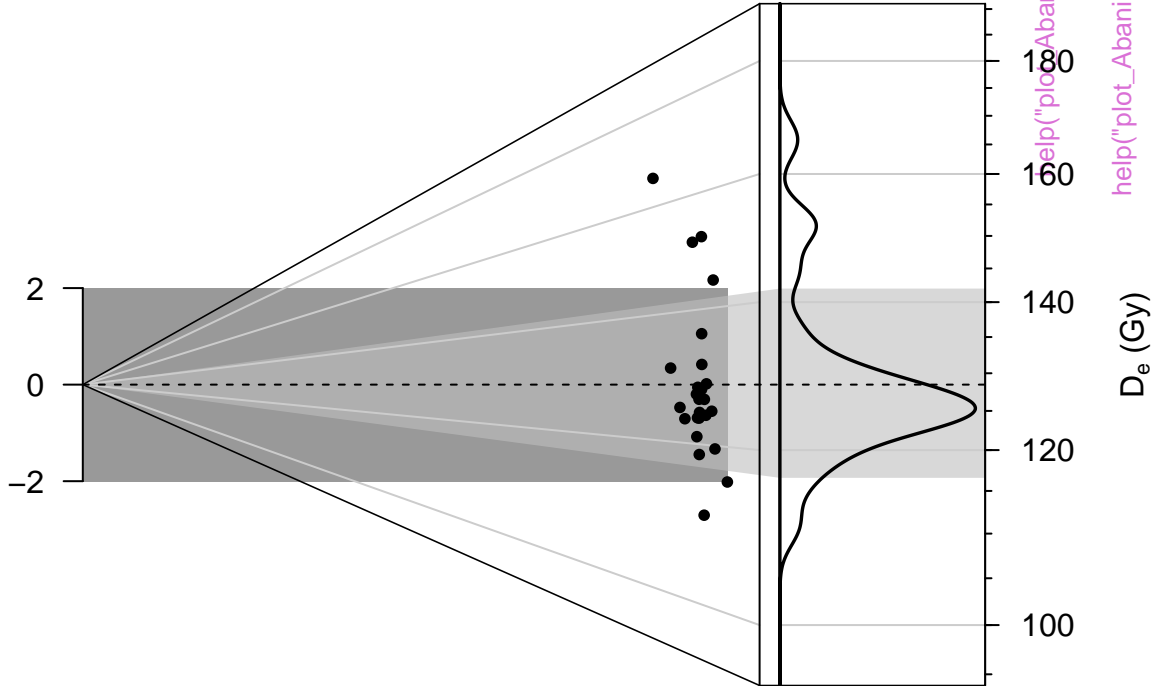
n = 25 | in confidence interval = 80 %



D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20 10 6.7

0

5

10

15

0

0.068

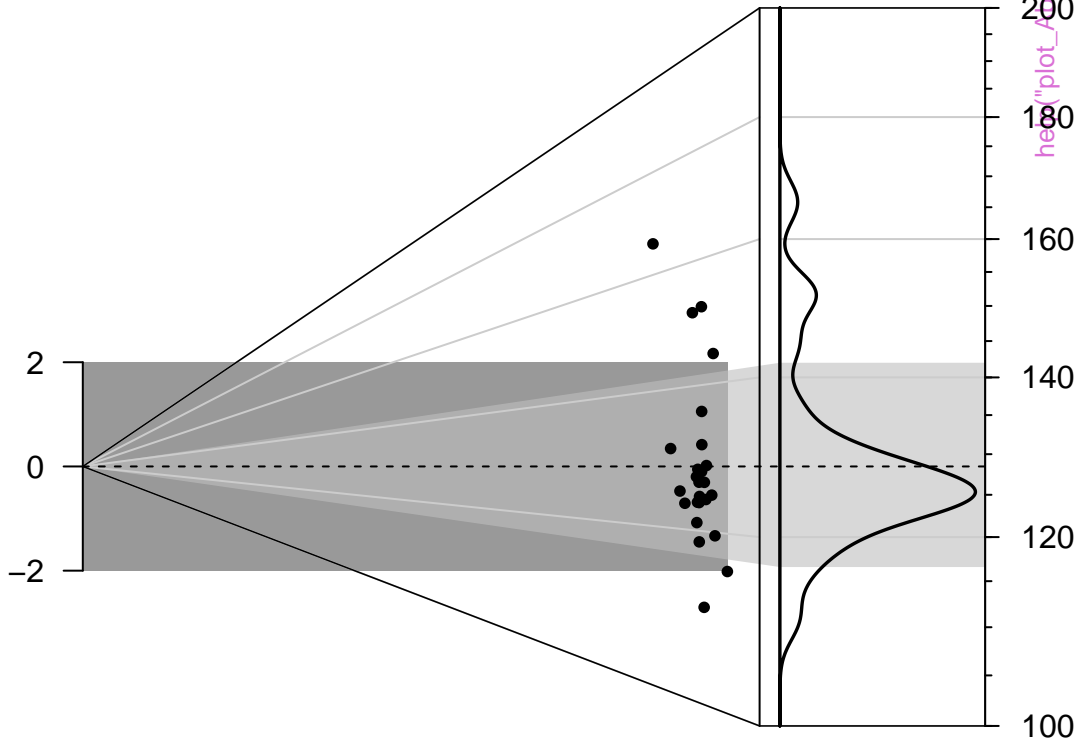
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20 10 6.7

0 5 10 15 0 0.068

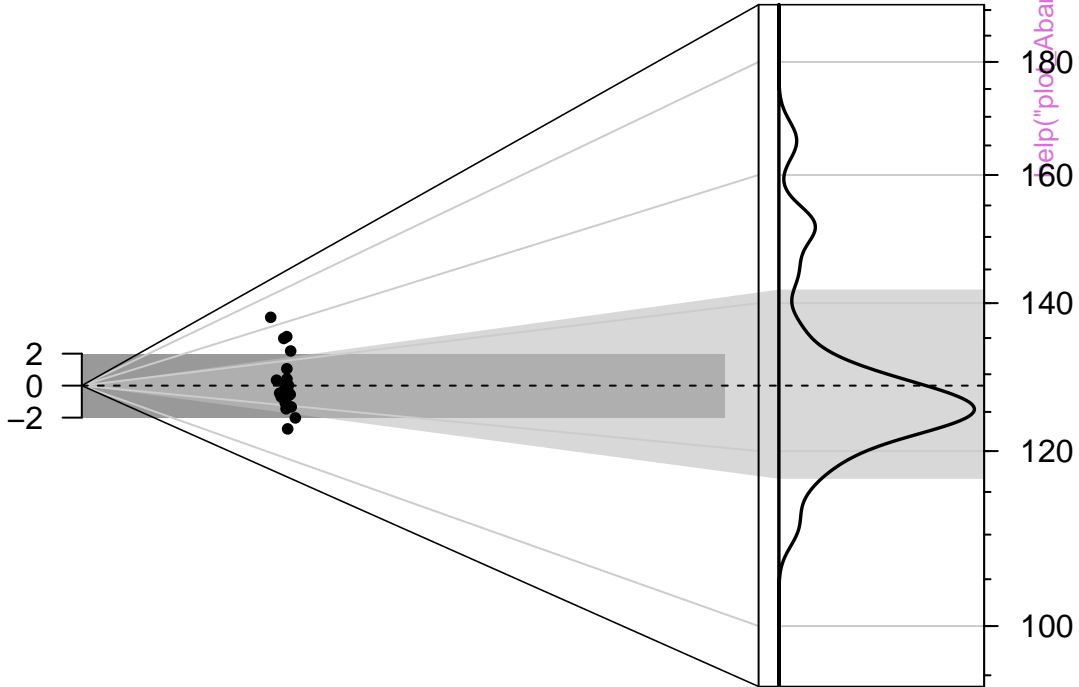
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



help("plot_AbanicoPlot")

help("plot_AbanicoPlot")

Relative standard error (%)

5

2.5

1.7

0

20

40

600

0.068

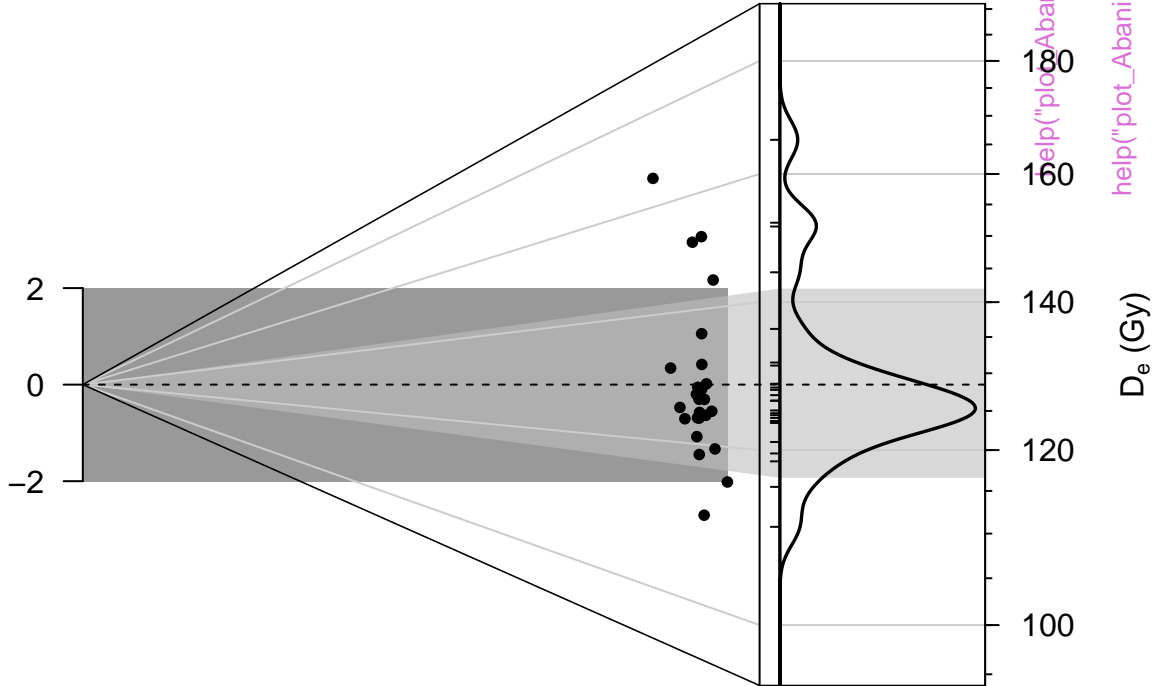
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20 10 6.7

0 5 10 15 0 0.068

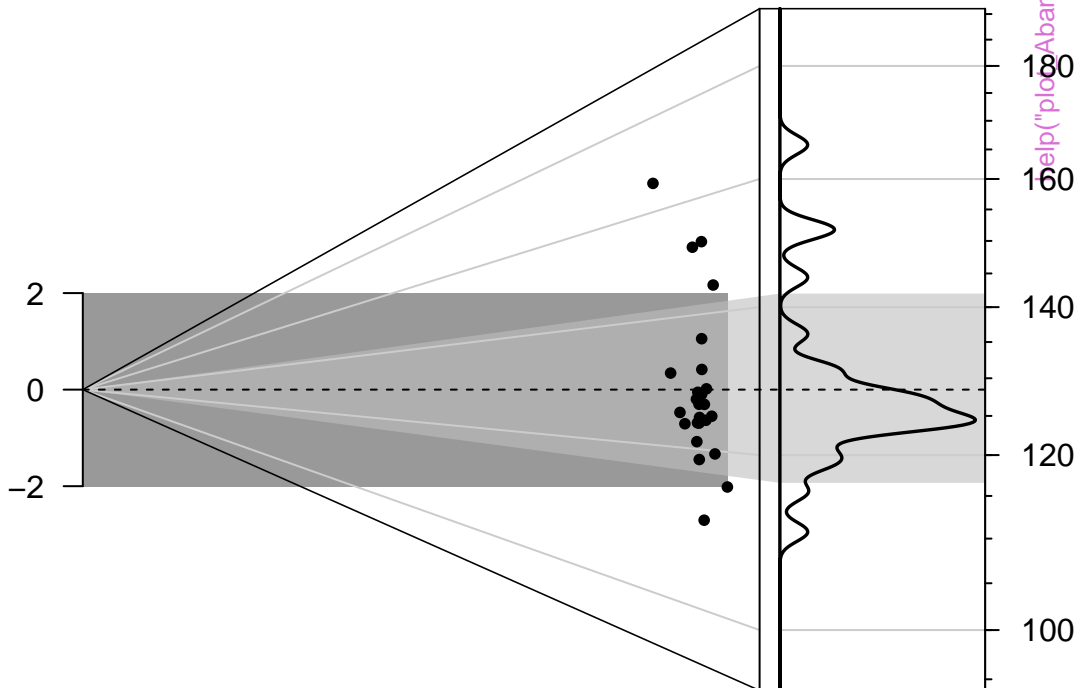
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



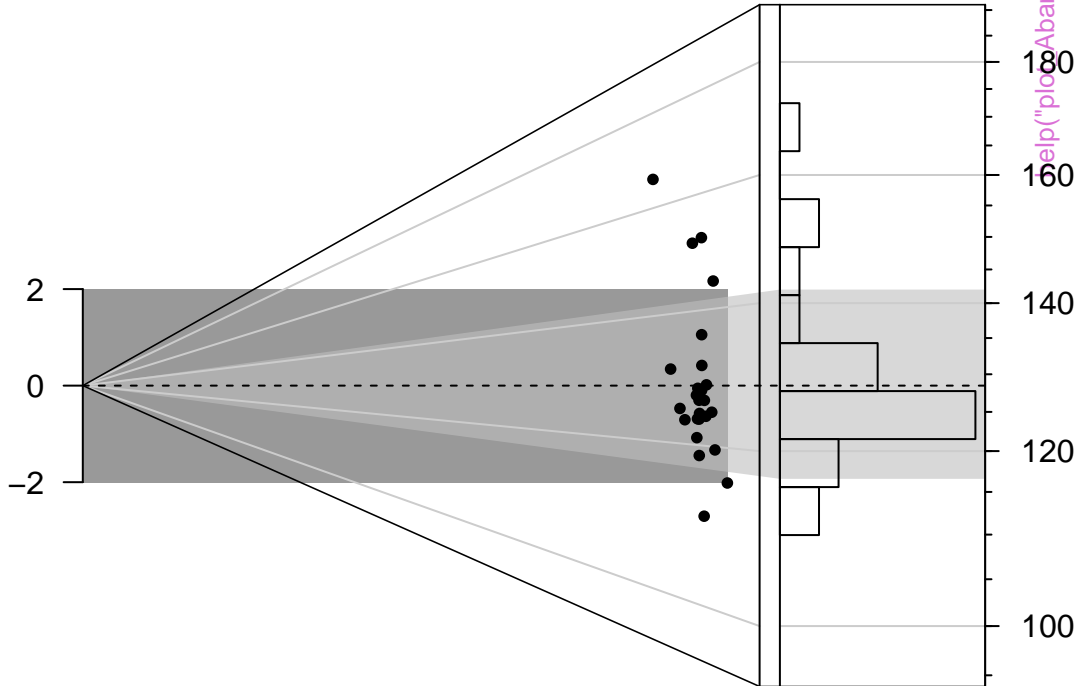
help("plot_AbanicoPlot")

D_e (Gy)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



help("plot_AbanicoPlot")

D_e (Gy)

help("plot_AbanicoPlot")

Relative standard error (%)

20

10

6.7

0

n

10

0

5

10

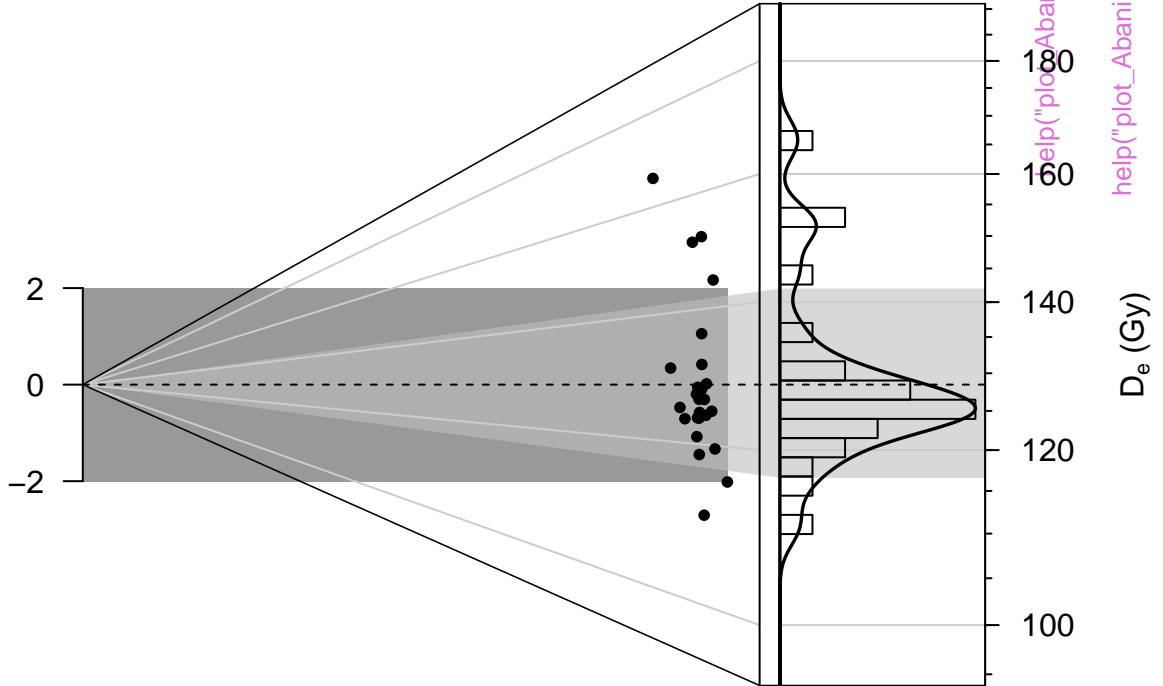
15

Precision

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



help("plot_AbanicoPlot")

help("plot_AbanicoPlot")

Relative standard error (%)

20

10

6.7

n

0

6

0

5

10

15

0

0.068

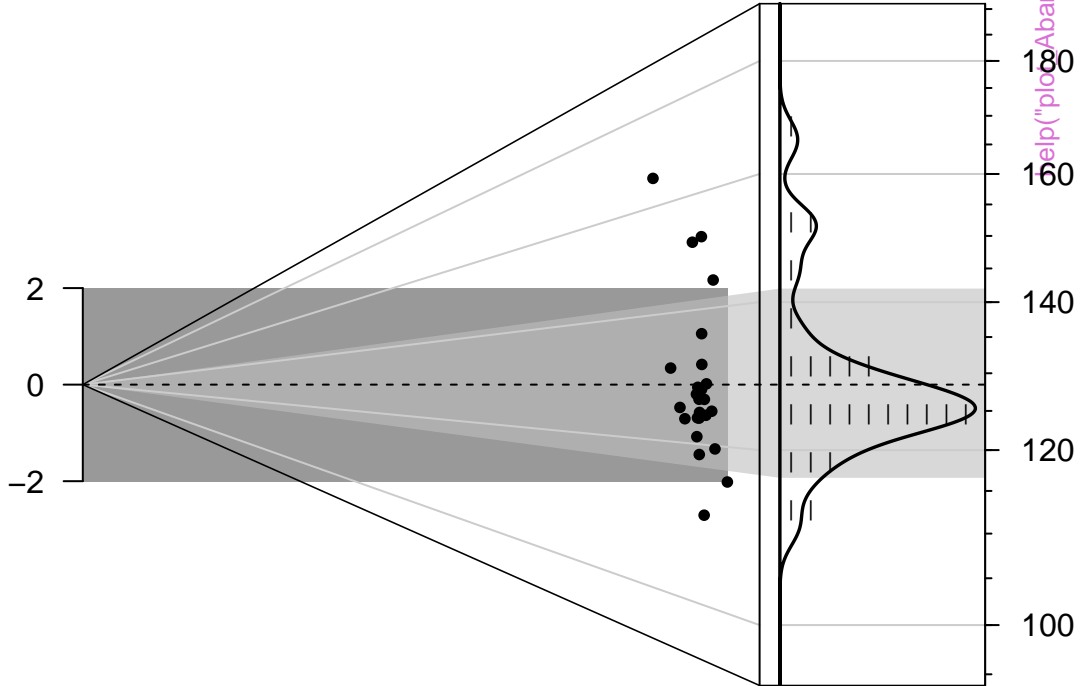
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20

10

6.7

0

5

10

15

0

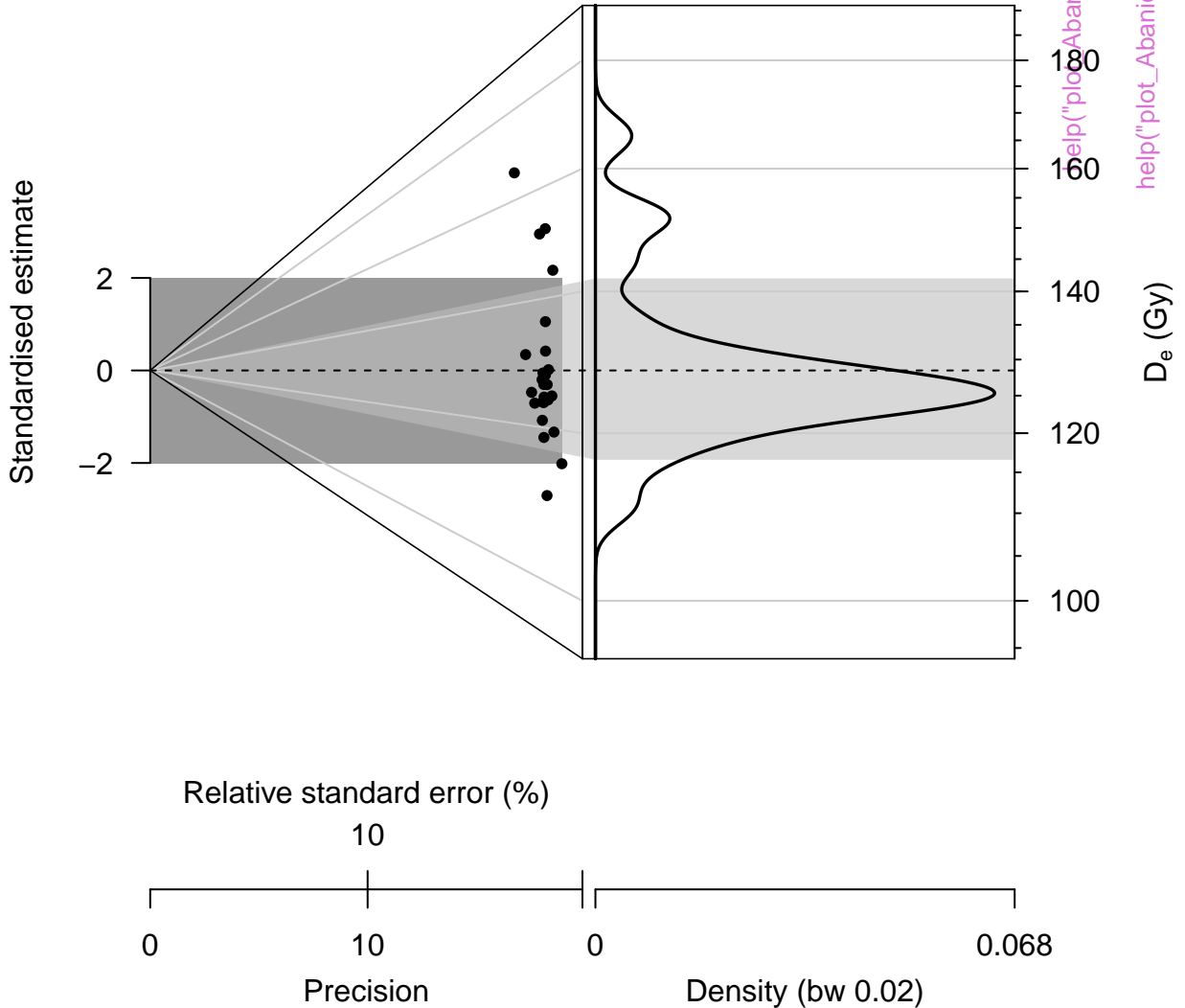
0.068

Precision

Density (bw 0.02)

D_e distribution

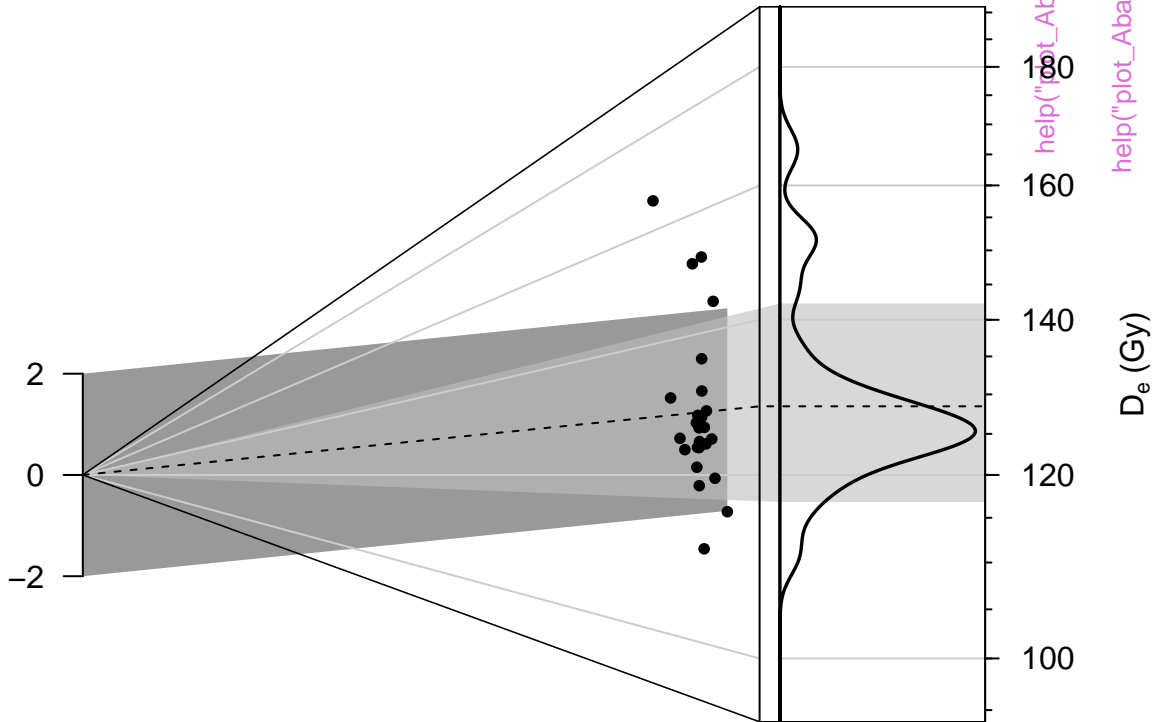
n = 25 | in confidence interval = 76 %



D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20

10

6.7

0

5

10

15

0

0.068

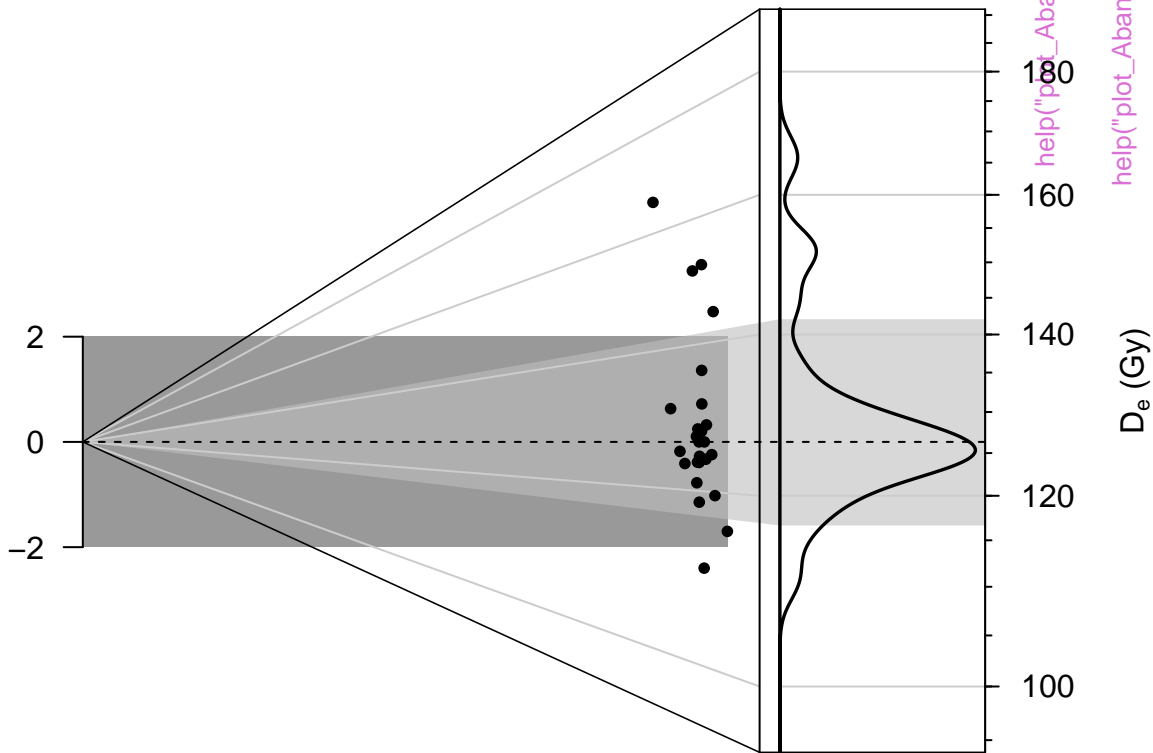
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 80 %

Standardised estimate



Relative standard error (%)

20

10

6.7

0

5

10

15

0

0.068

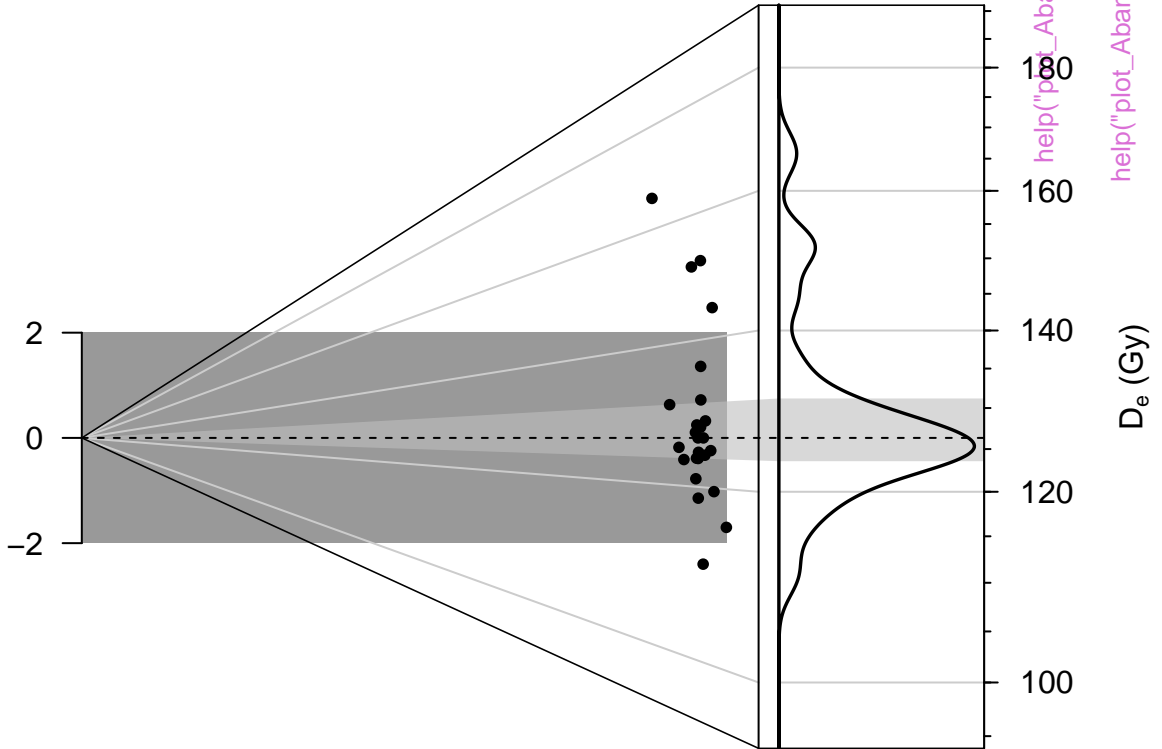
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 80 %

Standardised estimate



Relative standard error (%)

20 10 6.7

0 5 10 15 0 0.068

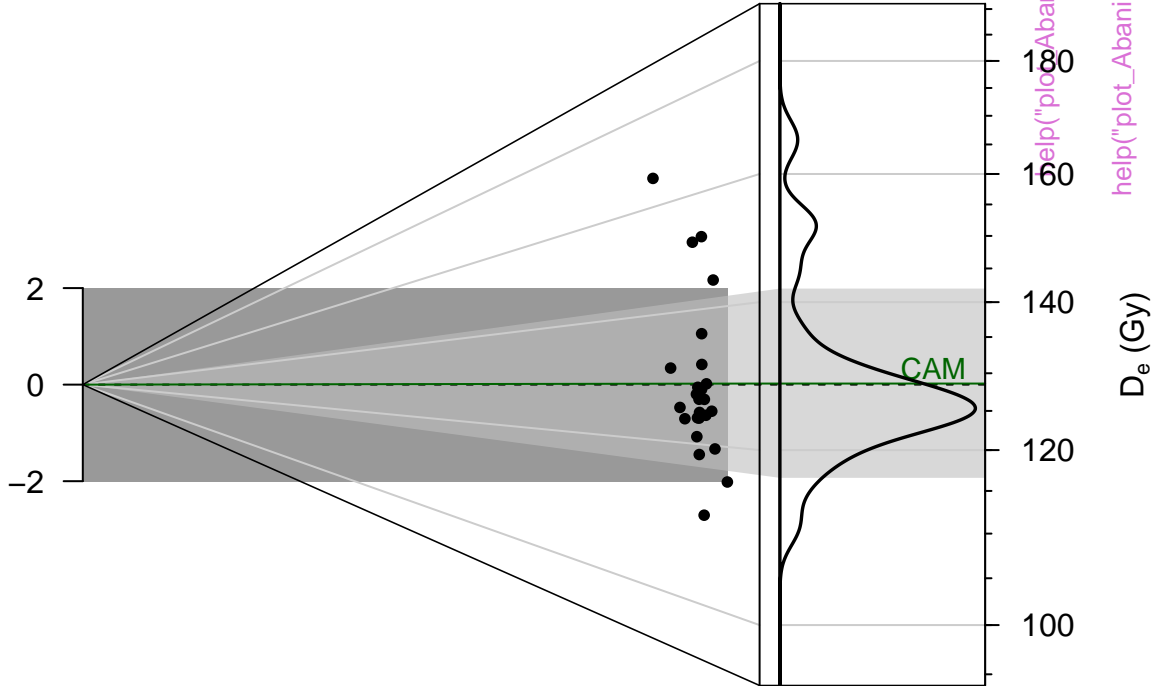
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20

10

6.7

0

5

10

15

0

0.068

Precision

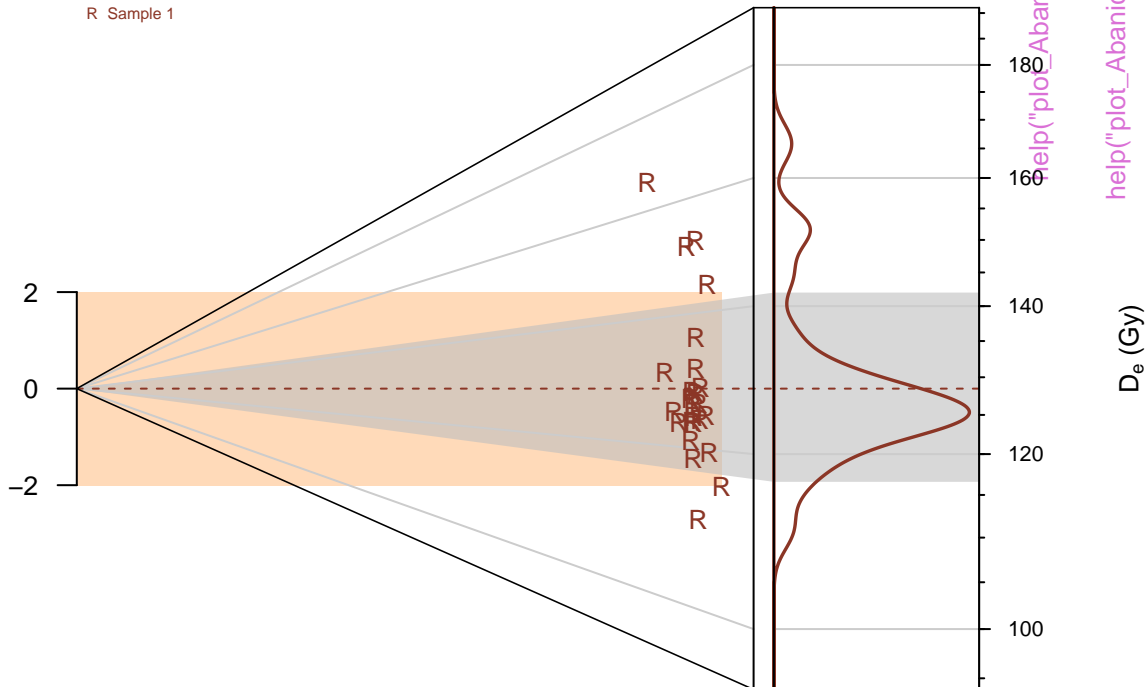
Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

R Sample 1

Standardised estimate



help("plot_AbanicoPlot")

help("plot_AbanicoPlot")

D_e (Gy)

Relative standard error (%)

20

10

6.7

0

5

10

15

0

0.068

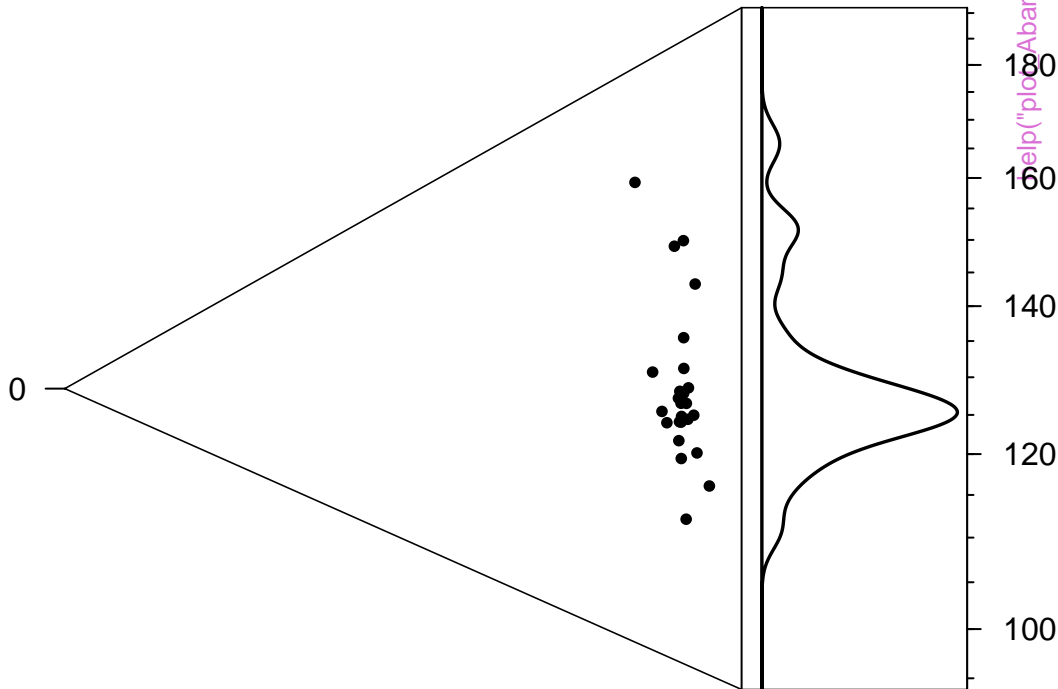
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



help("plot_AbanicoPlot")

help("plot_AbanicoPlot")

Relative standard error (%)

20

10

6.7

0

5

10

15

0

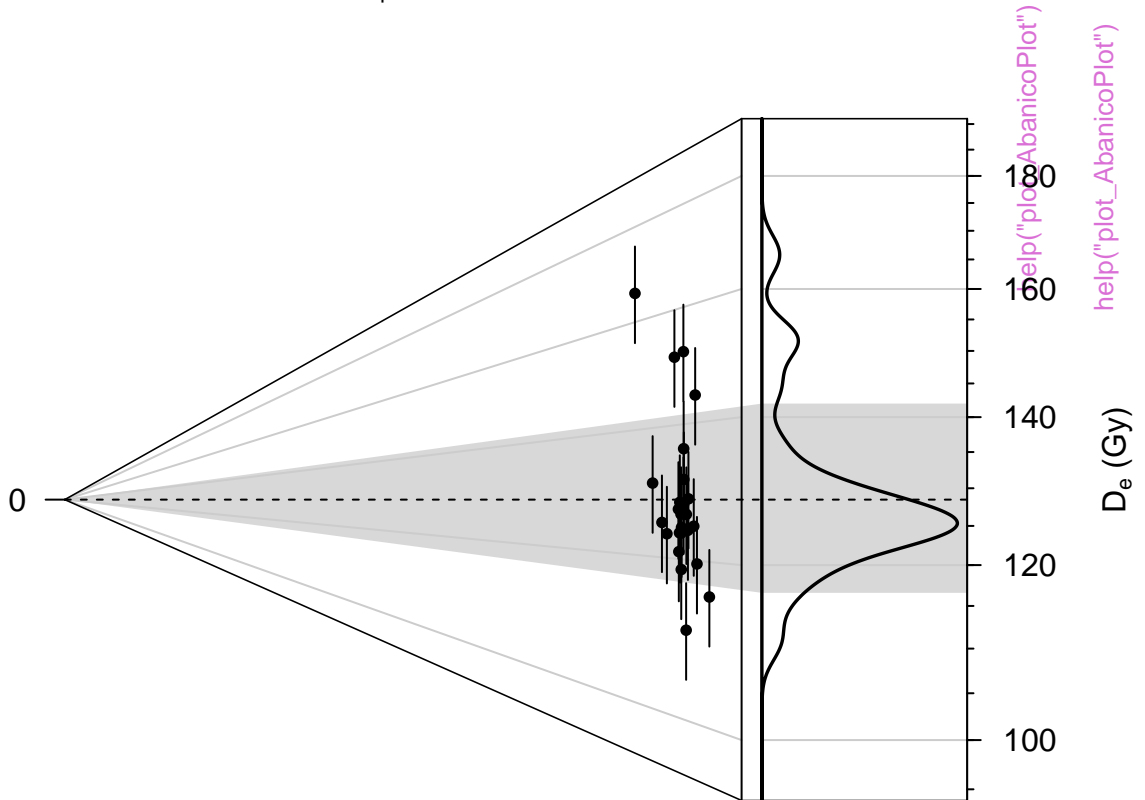
0.068

Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %



Relative standard error (%)

20

10

6.7

0

5

10

15

0

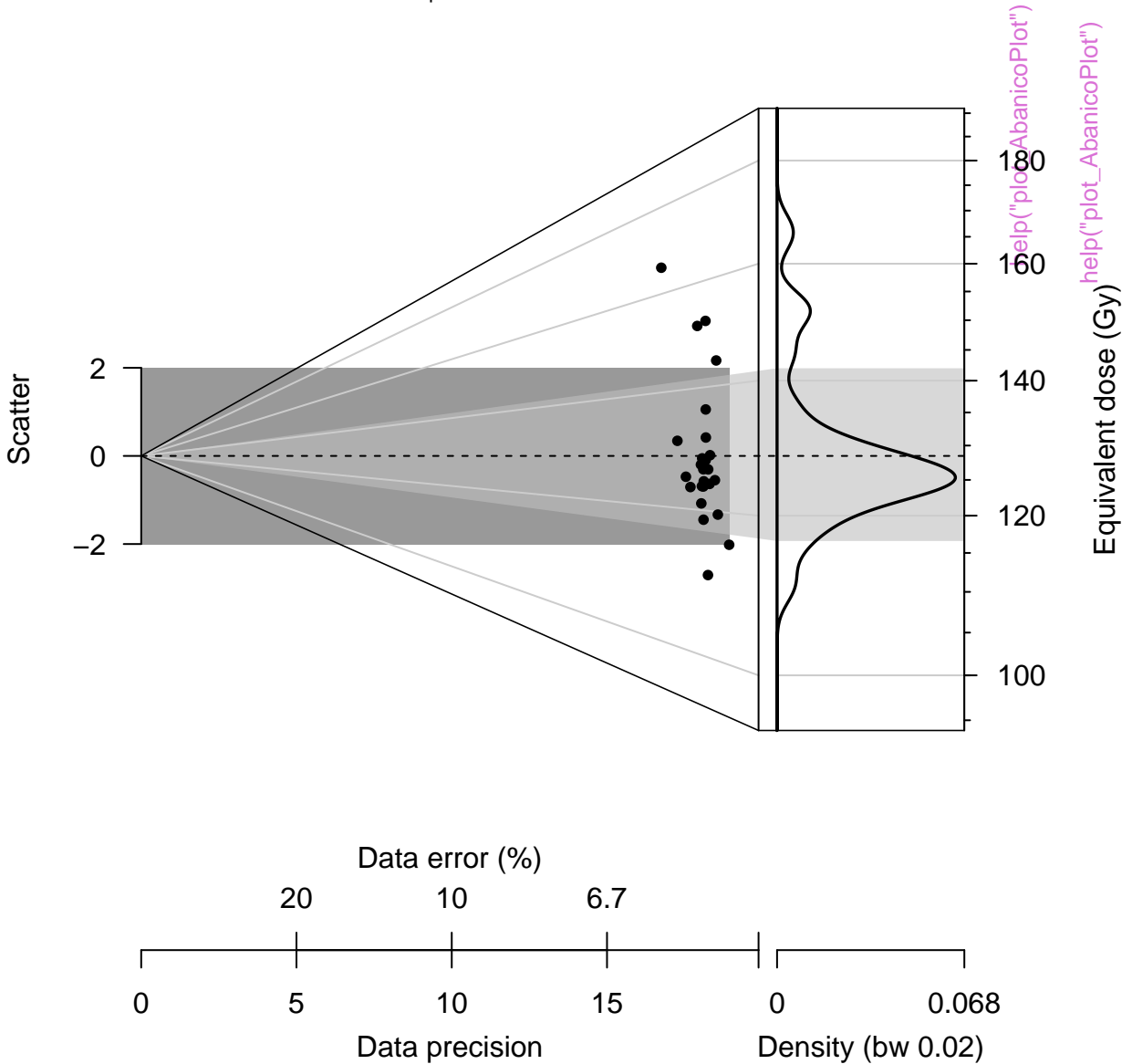
0.068

Precision

Density (bw 0.02)

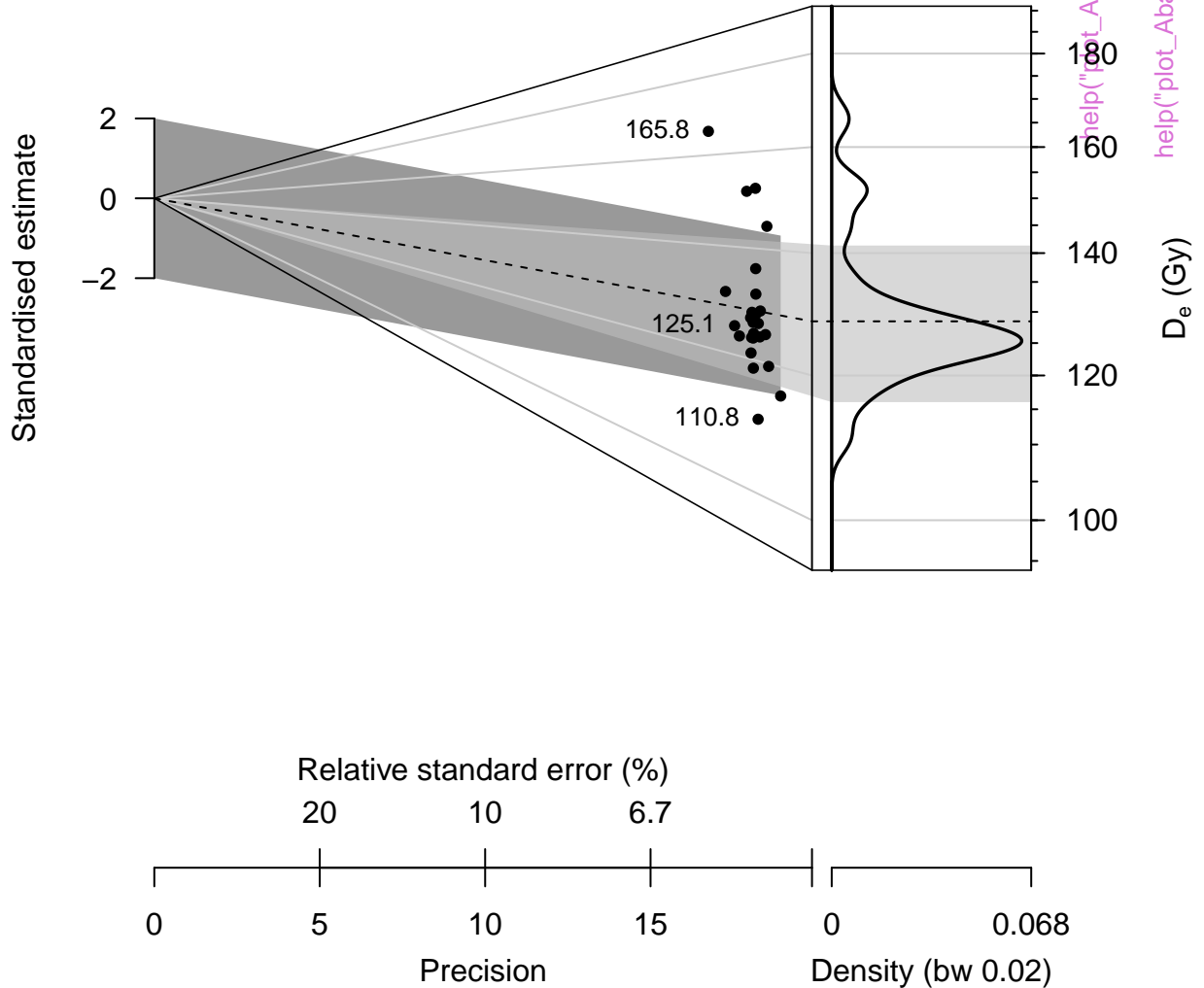
D_e distribution

n = 25 | in confidence interval = 76 %



D_e distribution

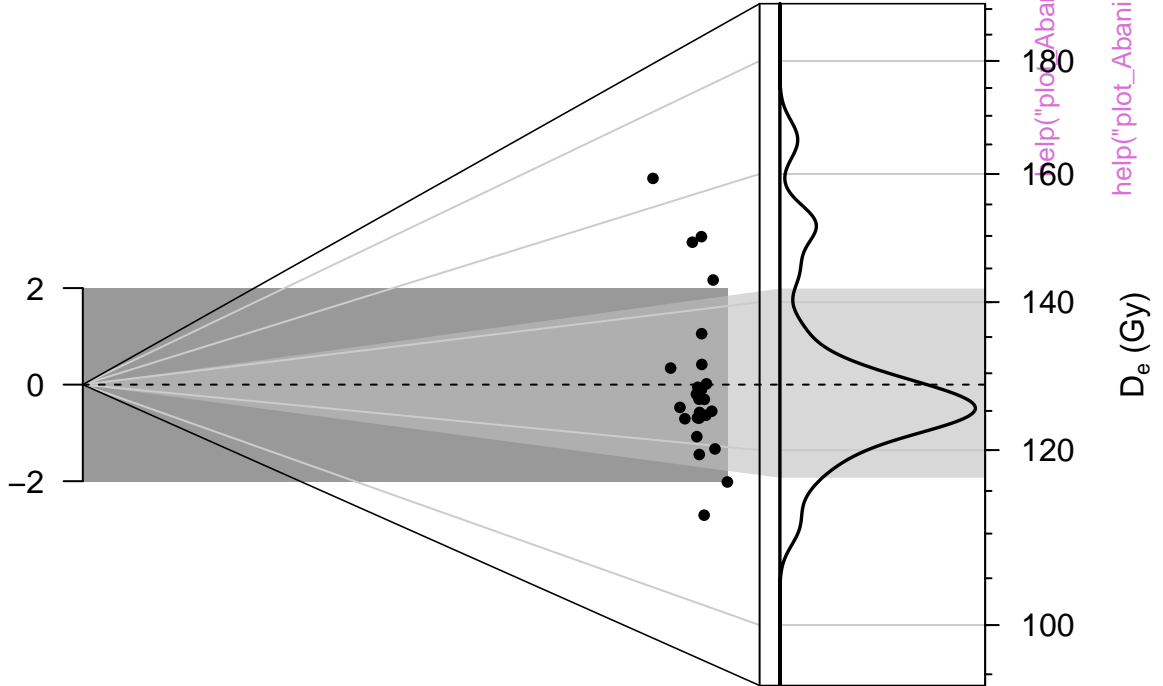
n = 25 | in confidence interval = 76 %



D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20 10 6.7

0

5

10

15

0

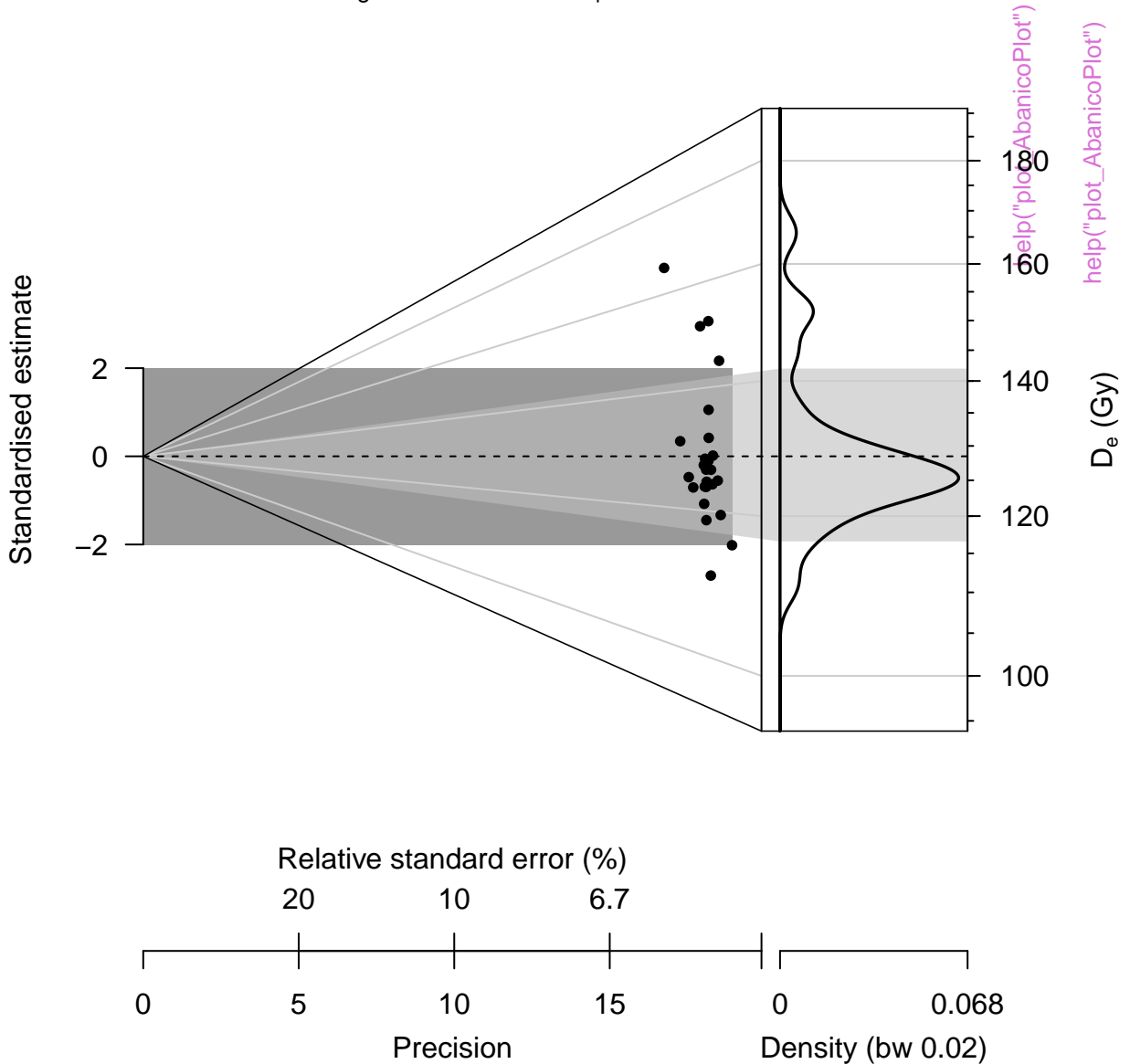
0.068

Precision

Density (bw 0.02)

D_e distribution

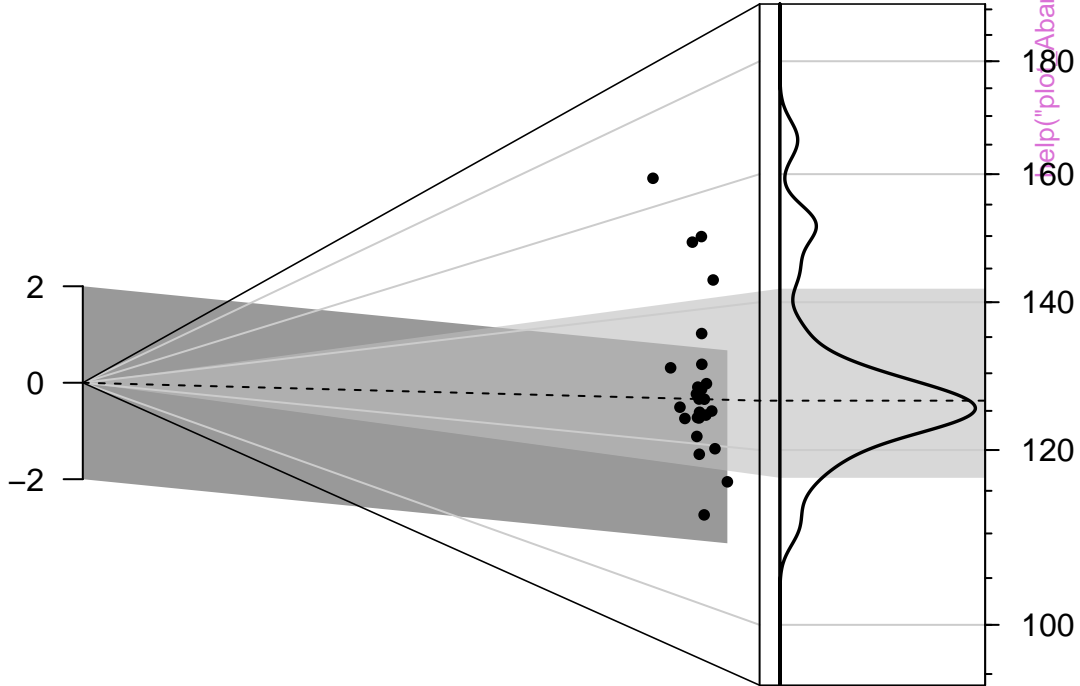
weighted mean = 128.12 | median = 126.34



D_e distribution

n = 25

Standardised estimate



help("plot_AbanicoPlot")

D_e (Gy)

Relative standard error (%)

20

10

6.7

0

5

10

15

0

0.068

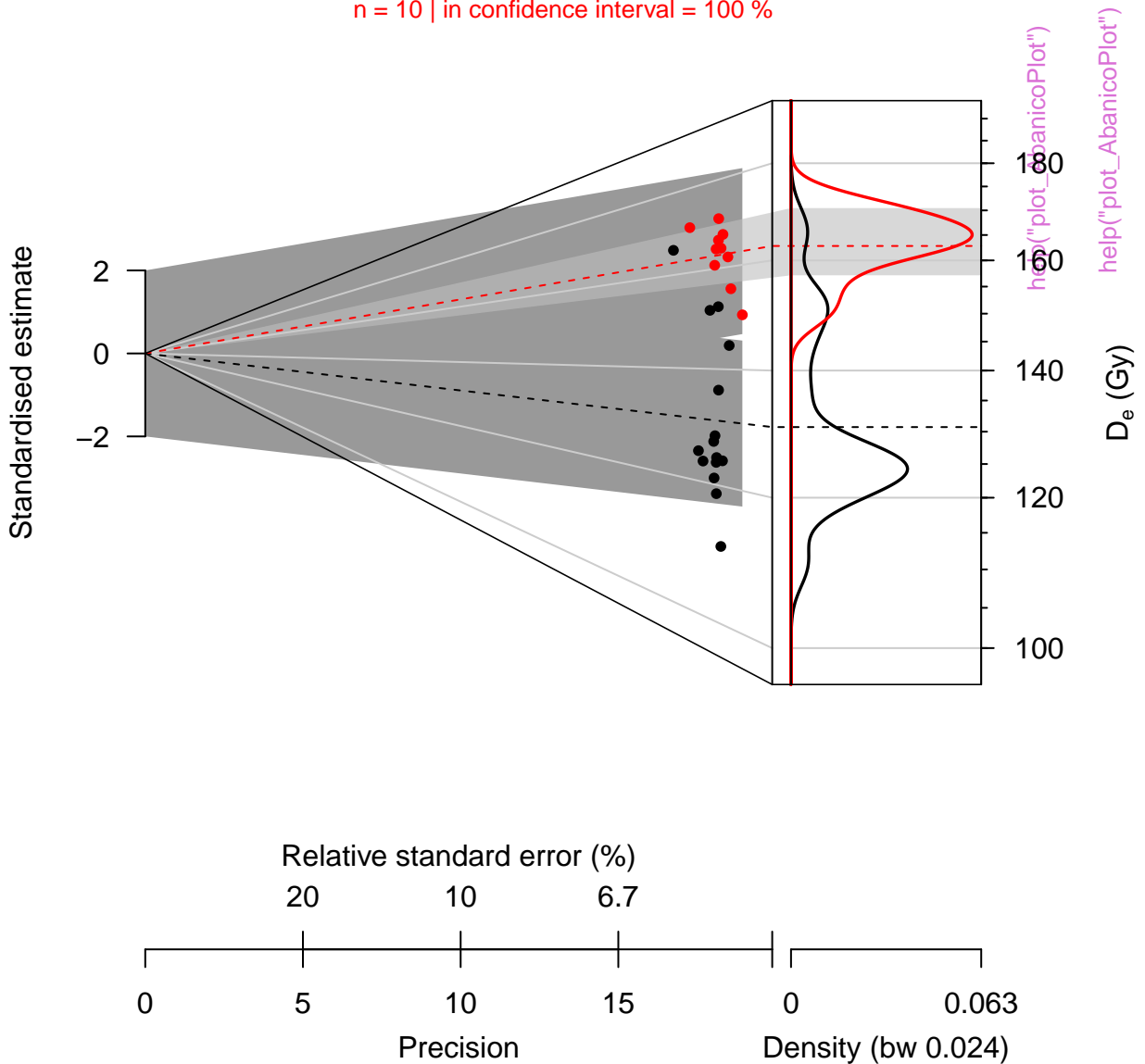
Precision

Density (bw 0.02)

D_e distribution

n = 15 | in confidence interval = 73.3 %

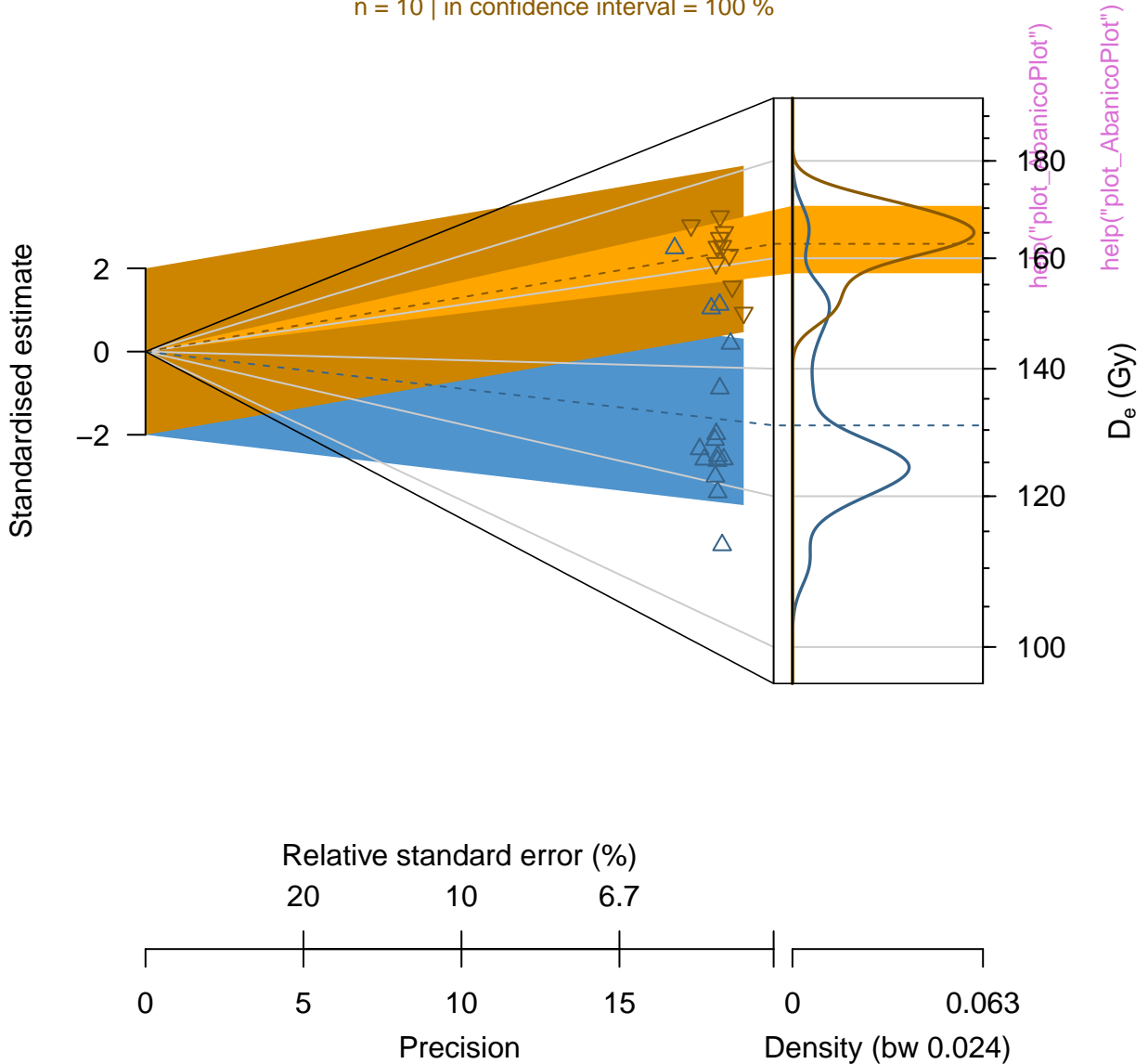
n = 10 | in confidence interval = 100 %

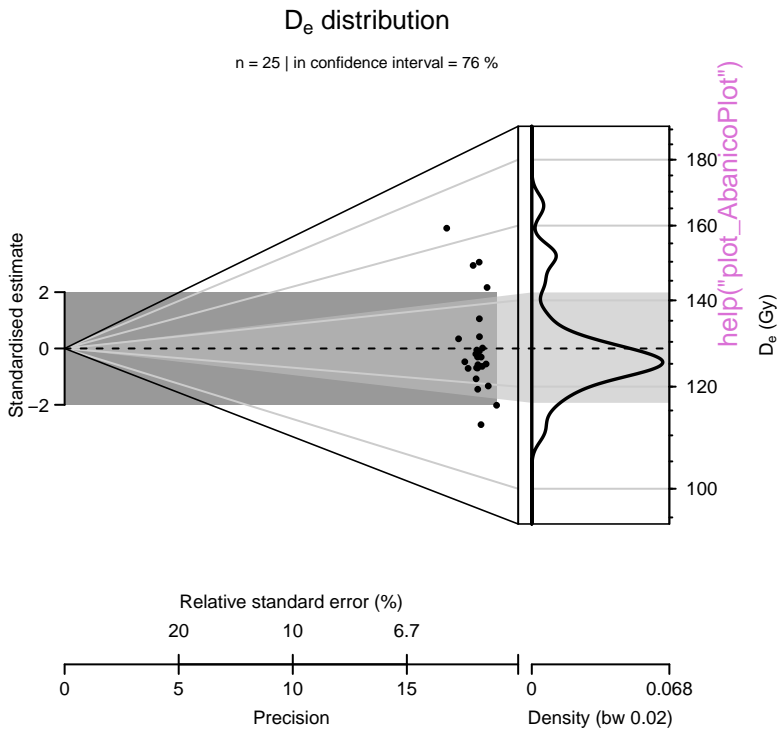


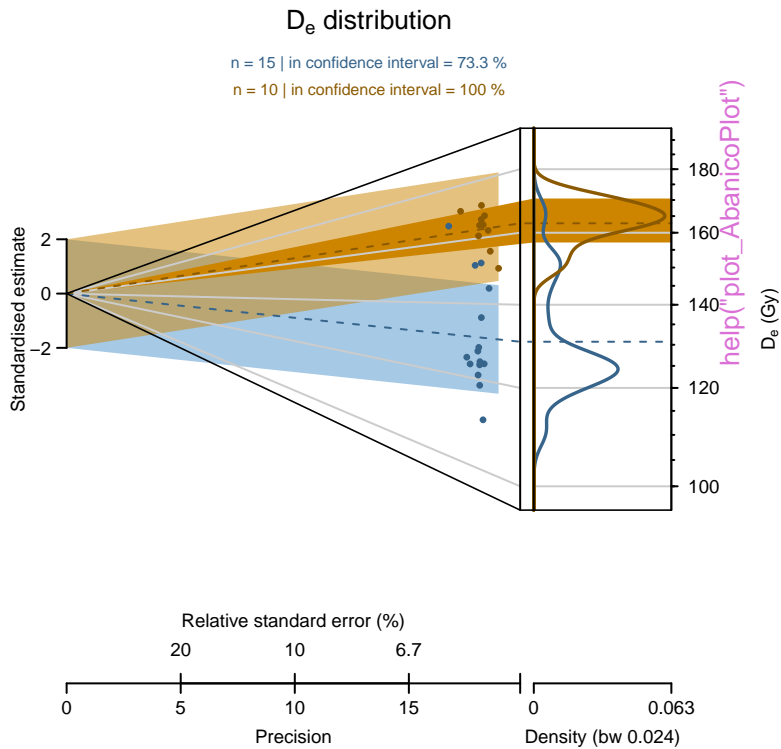
D_e distribution

n = 15 | in confidence interval = 73.3 %

n = 10 | in confidence interval = 100 %







Dose recovery test

Example data



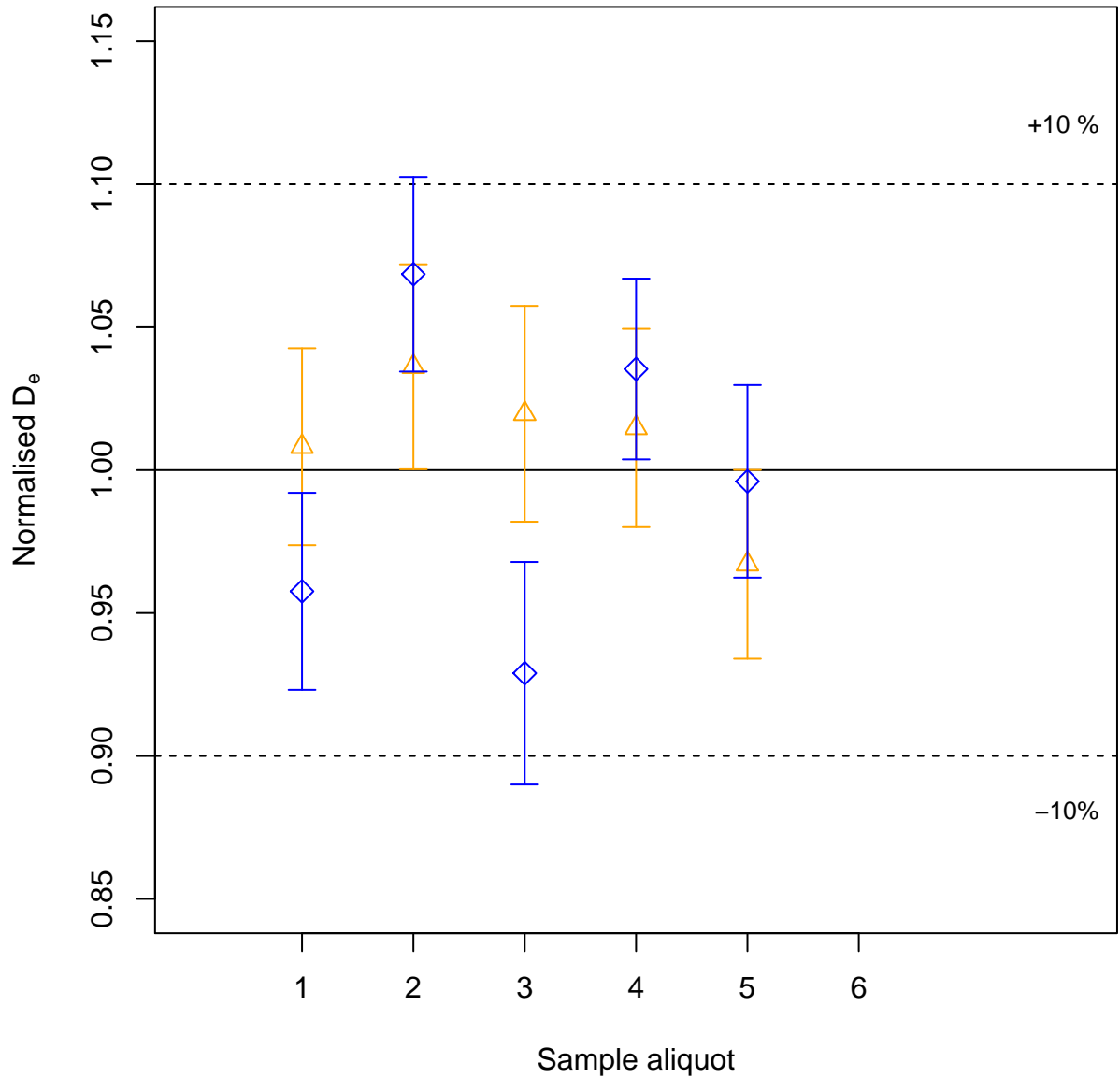
Dose recovery test



Dose recovery test



Dose recovery test



Dose recovery test



Dose recovery test

| n = 5 | weighted mean = 1.01 |

| n = 5 | weighted mean = 1 |



Dose recovery test

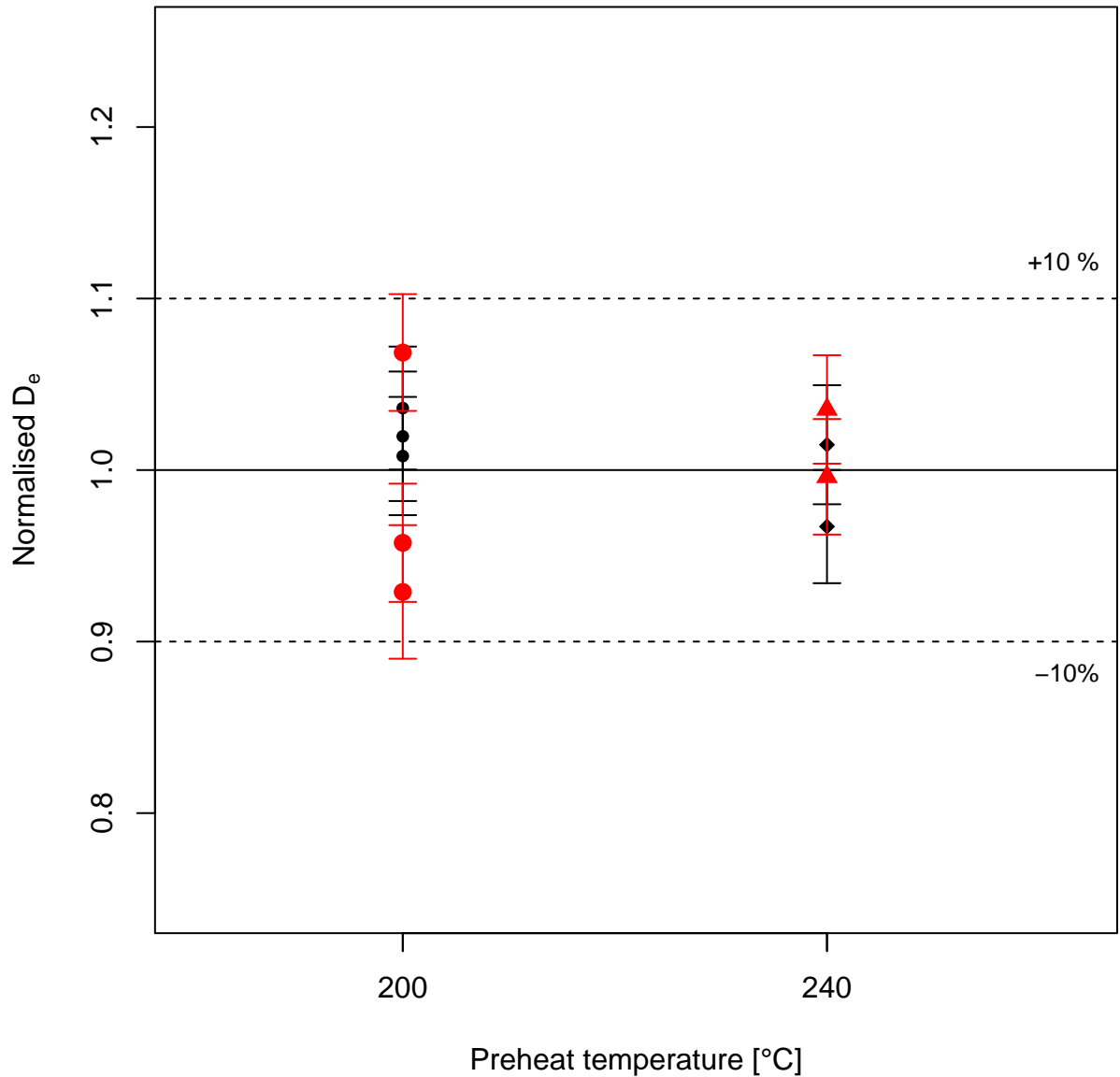


Dose recovery test

Example data



Dose recovery test

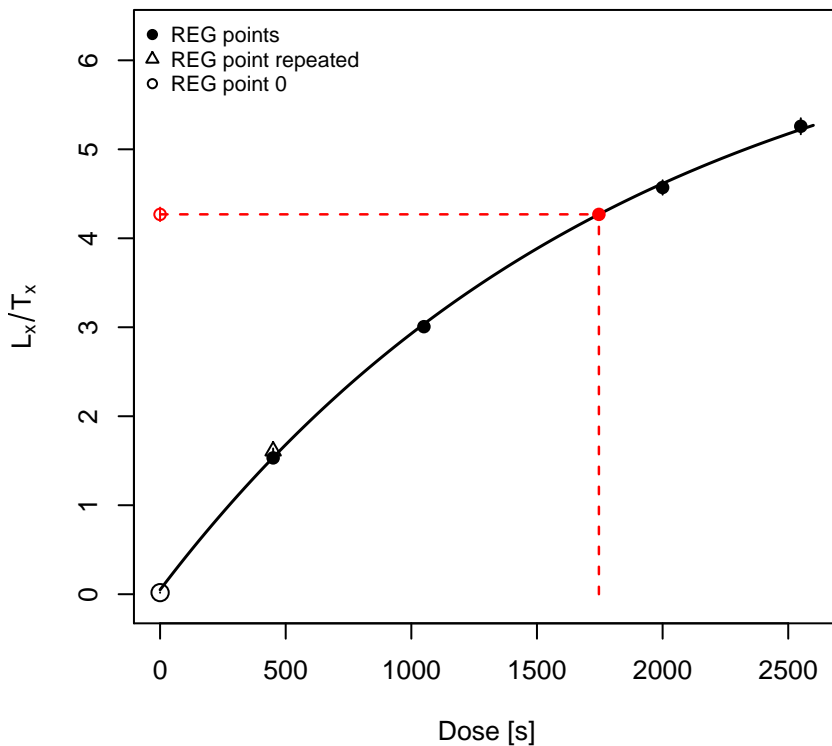


Dose recovery test

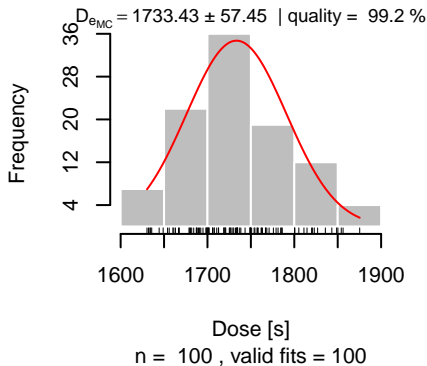


Growth curve

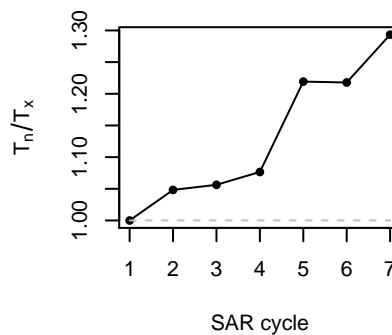
$D_e = 1746.54 \pm 57.45$ | fit: EXP



D_e from MC simulation

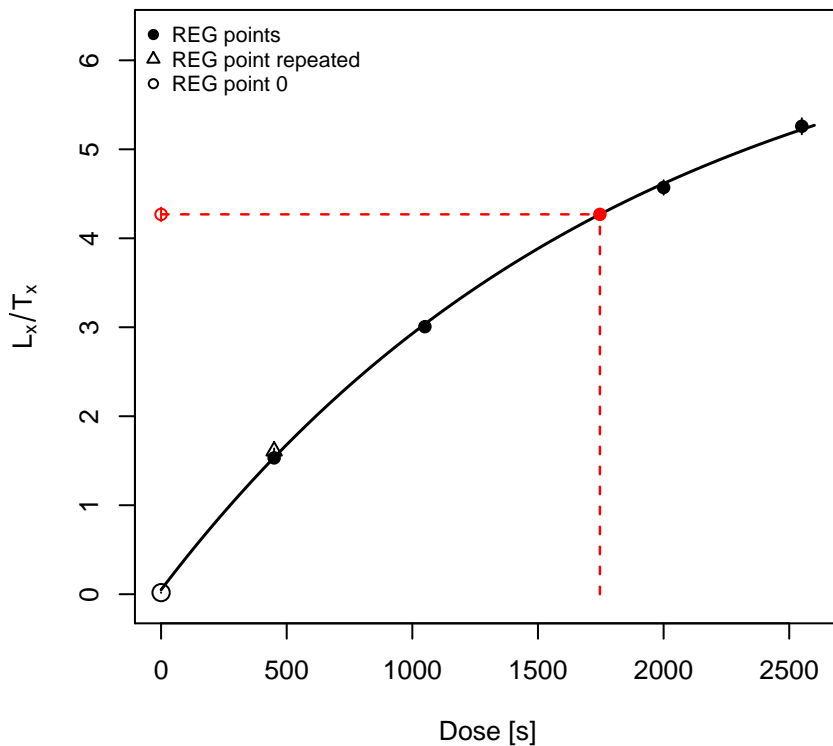


Test dose response



Growth curve

$D_e = 1746.54 \pm 59.97$ | fit: EXP



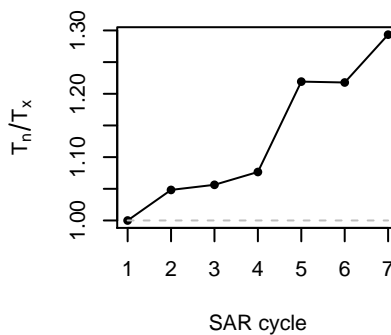
D_e from MC simulation

$D_{eMC} = 1732.18 \pm 59.97$ | quality = 99.2 %

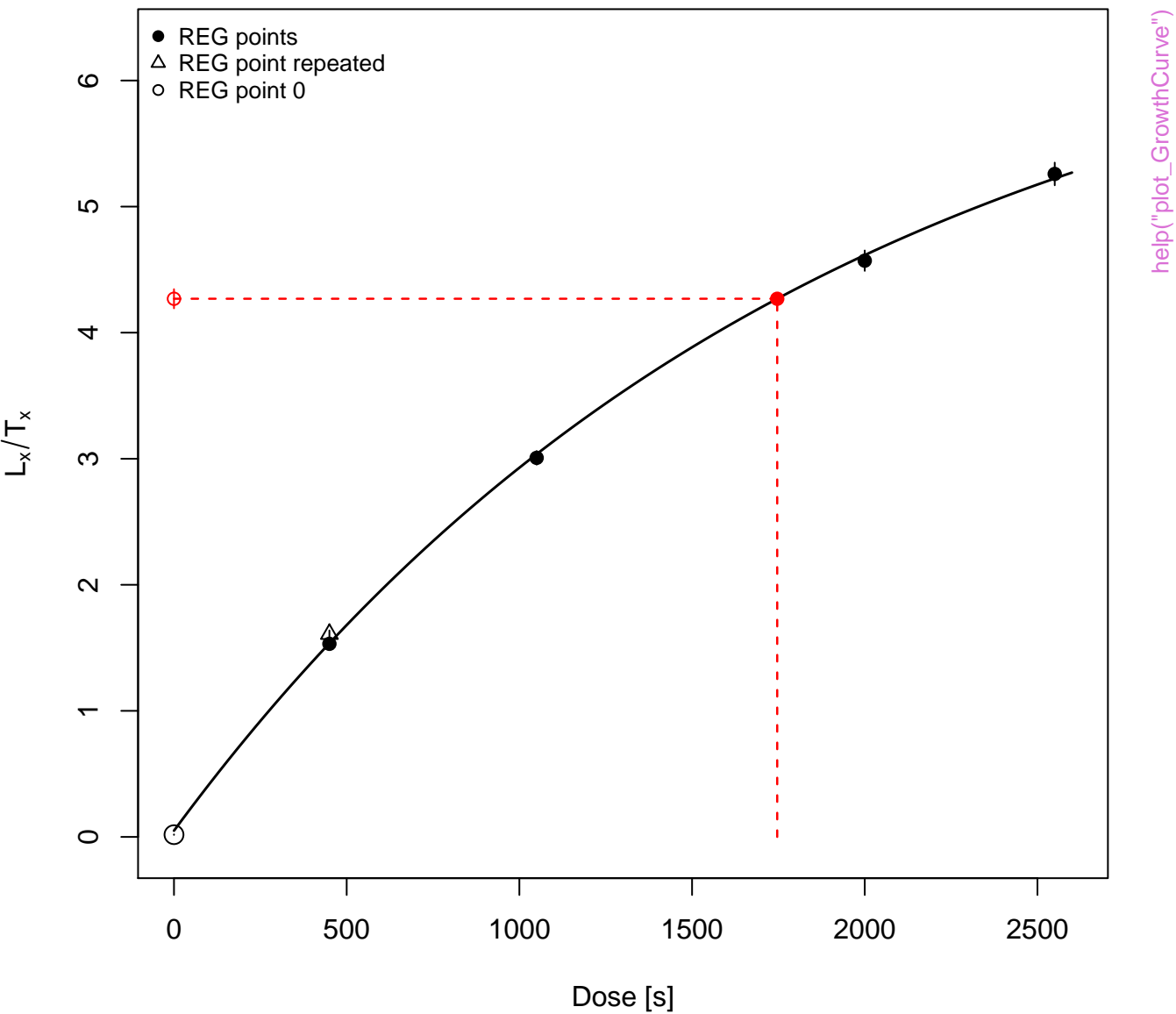


Dose [s]
n = 100 , valid fits = 100

Test dose response

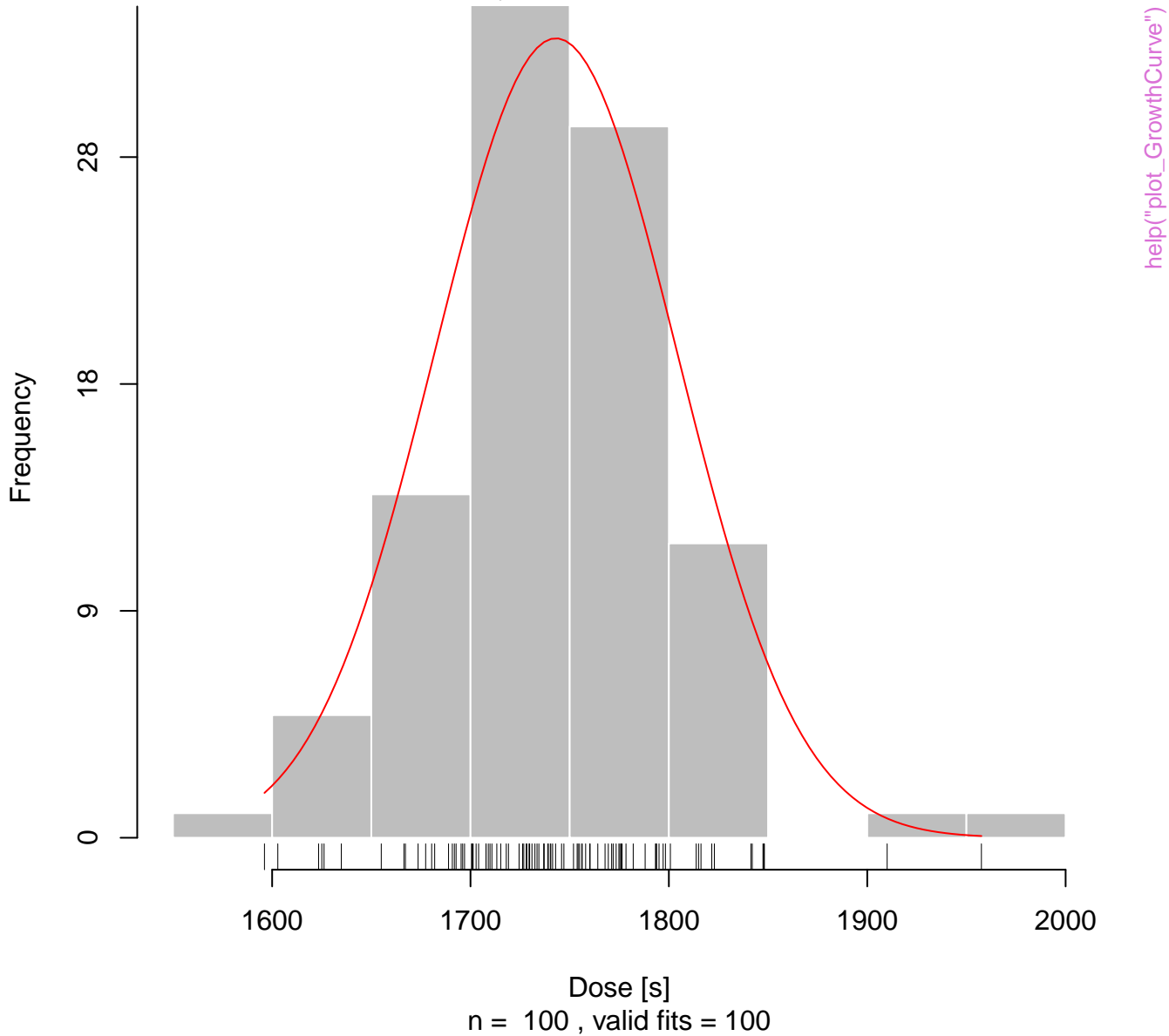


Growth curve

$$D_e = 1746.54 \pm 61.2 \quad | \text{ fit: EXP}$$


D_e from MC simulation

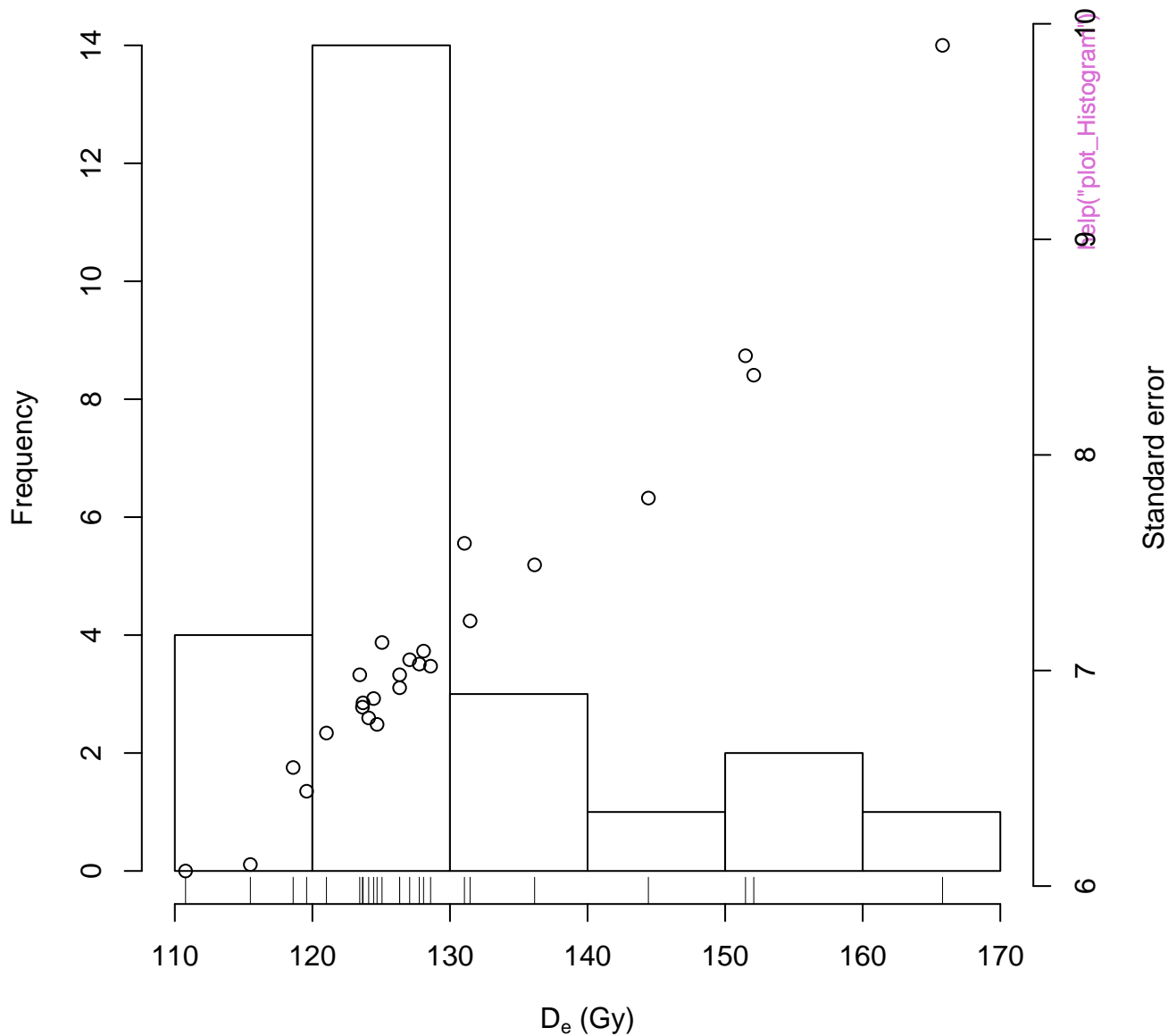
D_{MC} = 1743.04 ± 61.2 | quality = 99.8 %



Test dose response

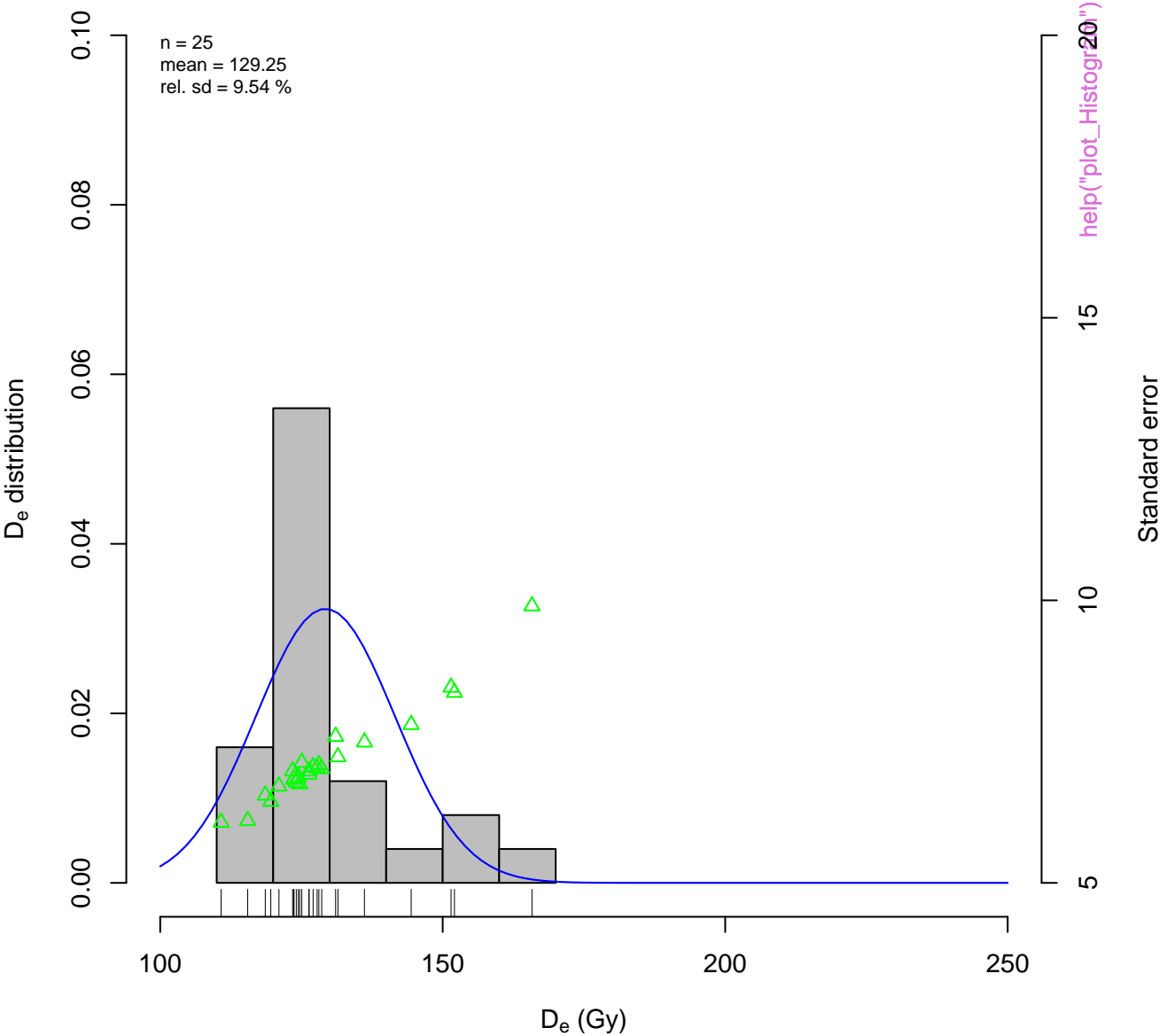


Histogram

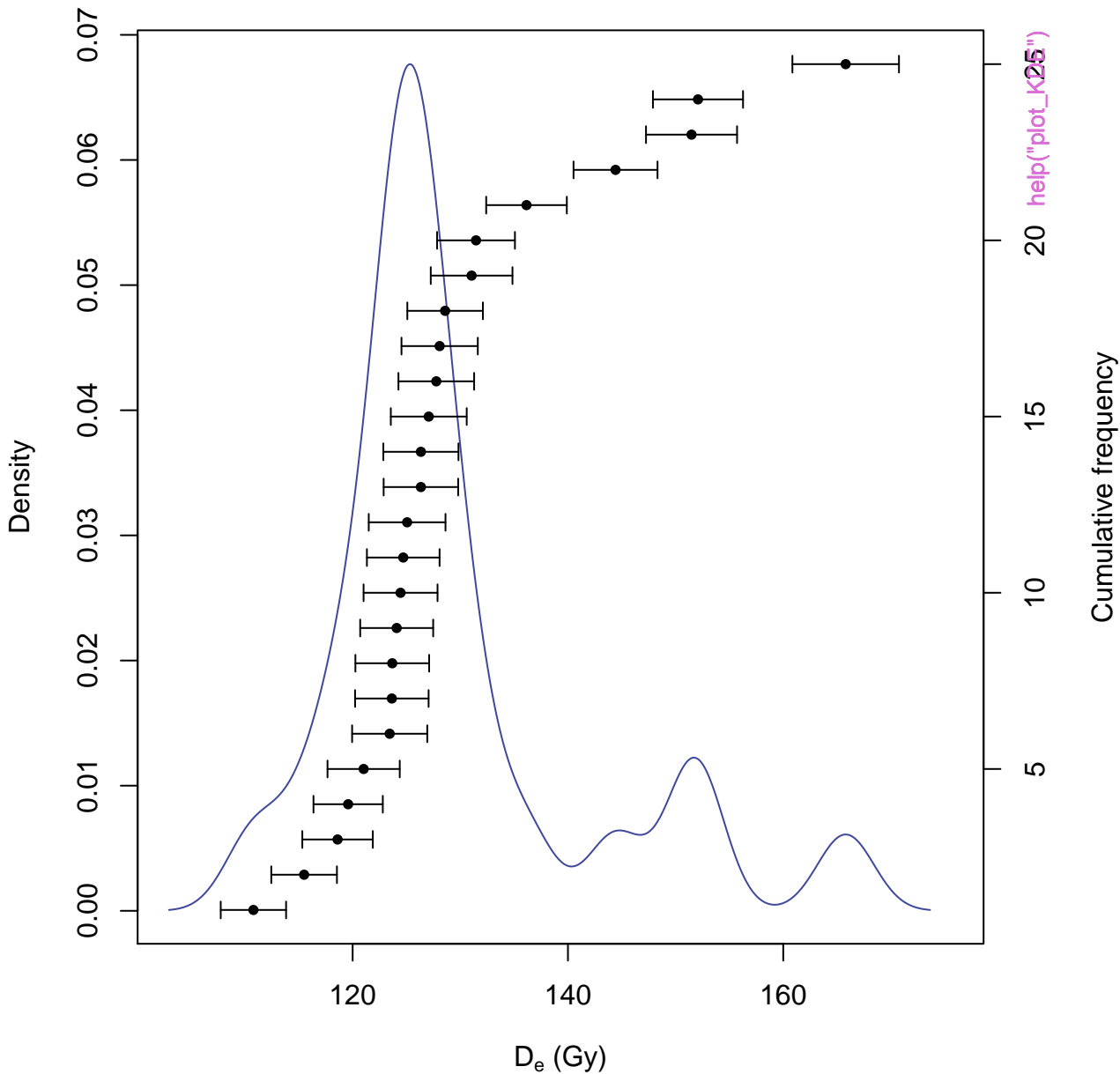


Histogram of De-values

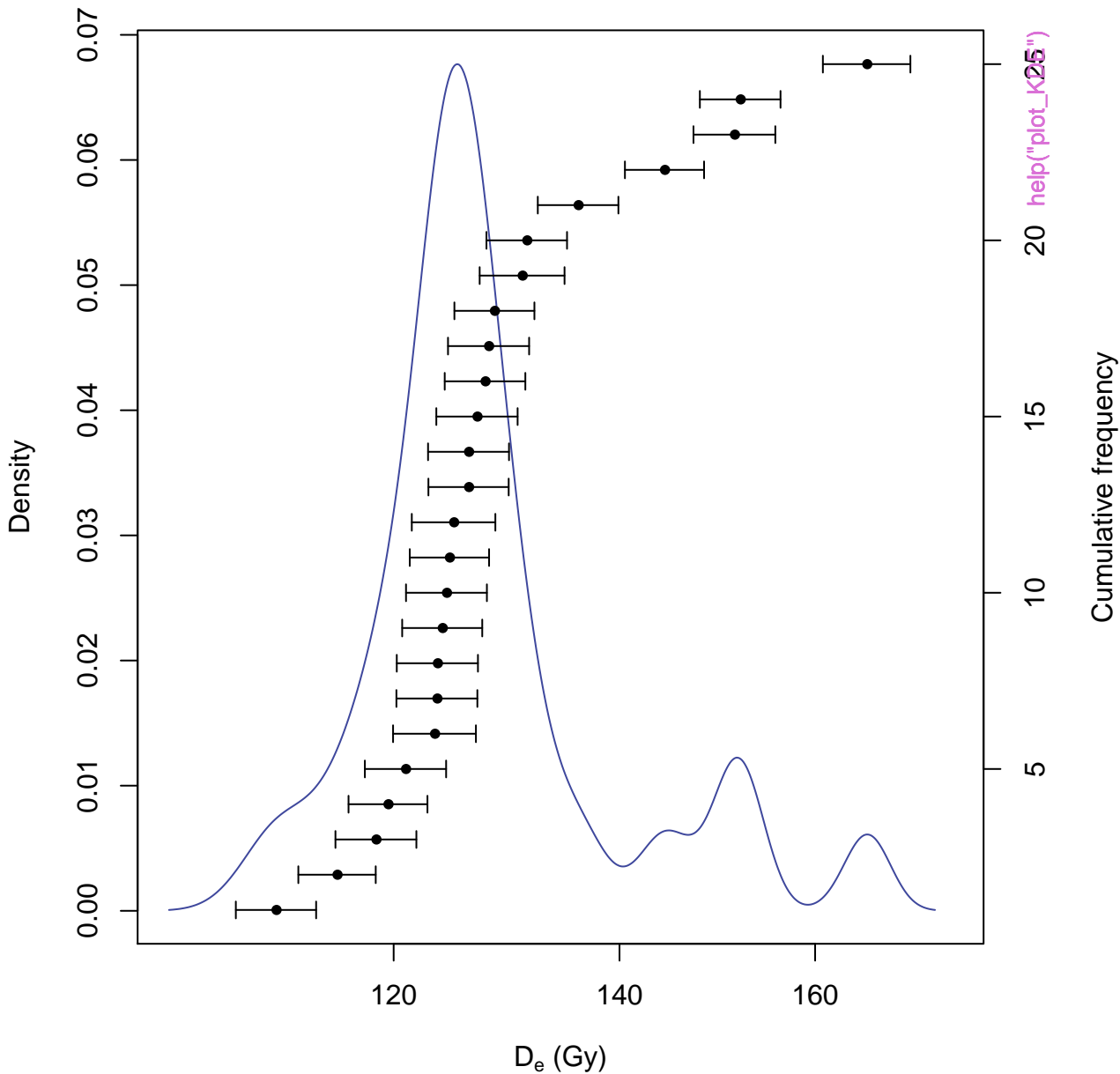
Example data set



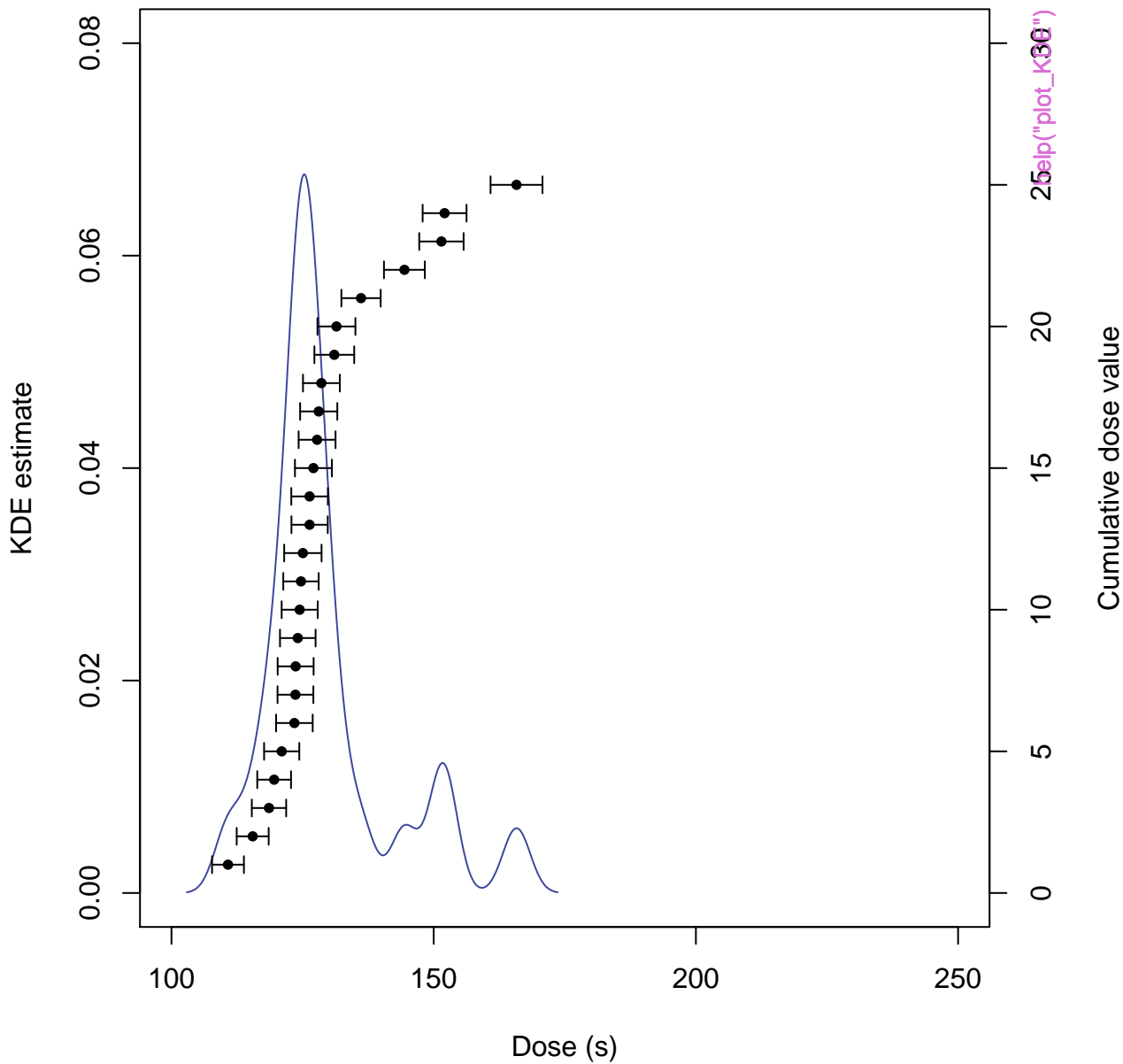
D_e distribution



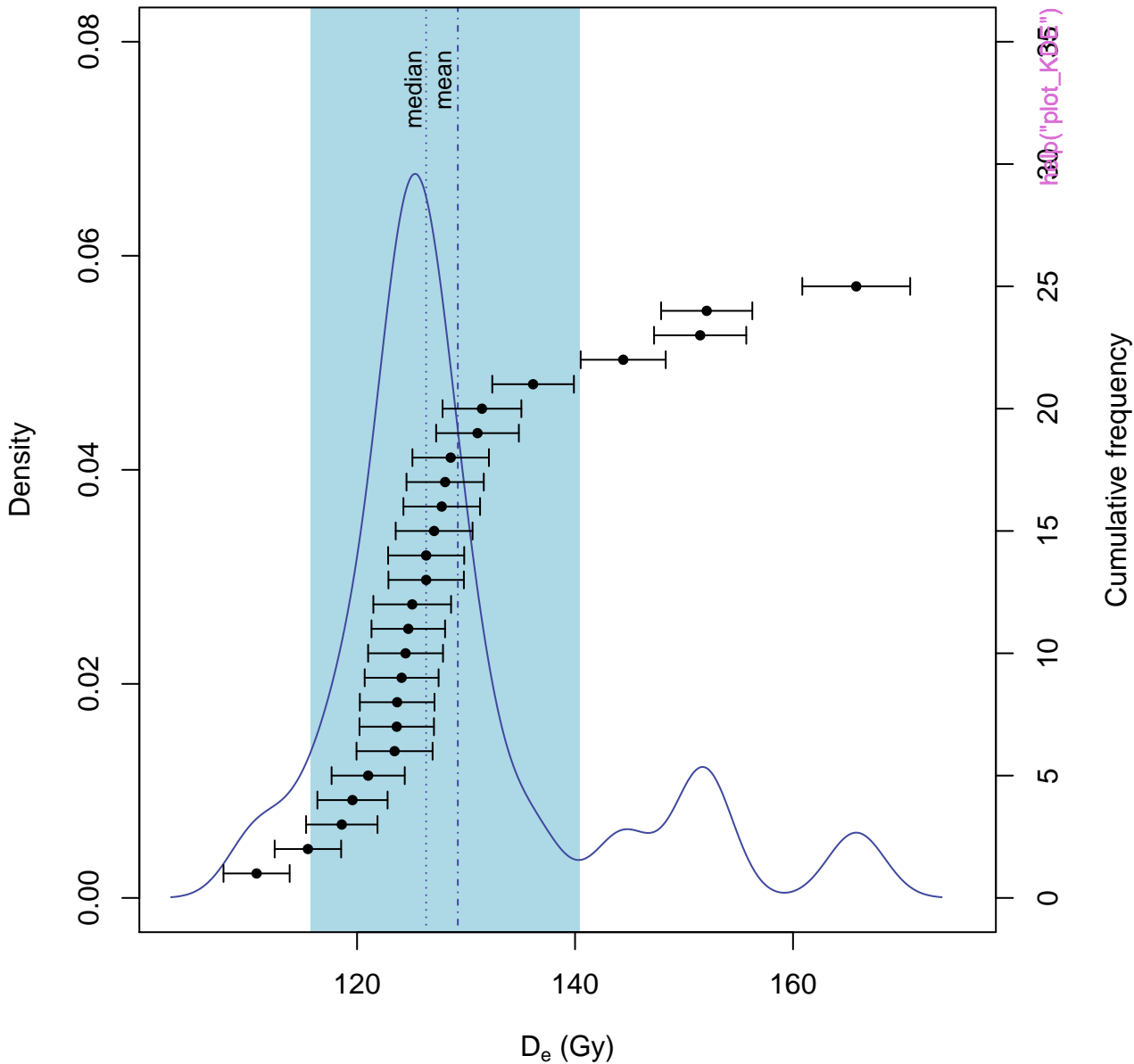
D_e distribution



Dose distribution

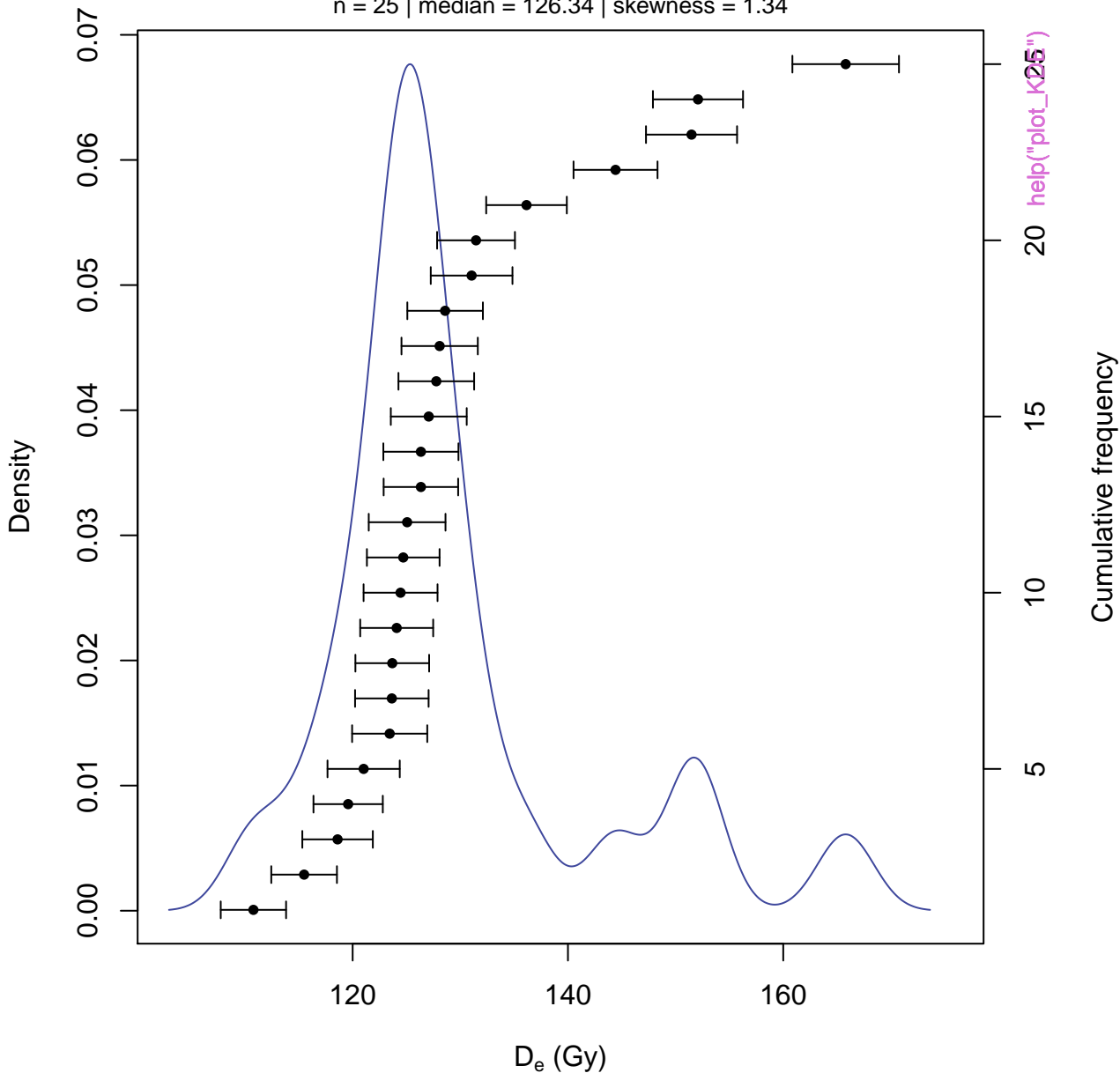


D_e distribution

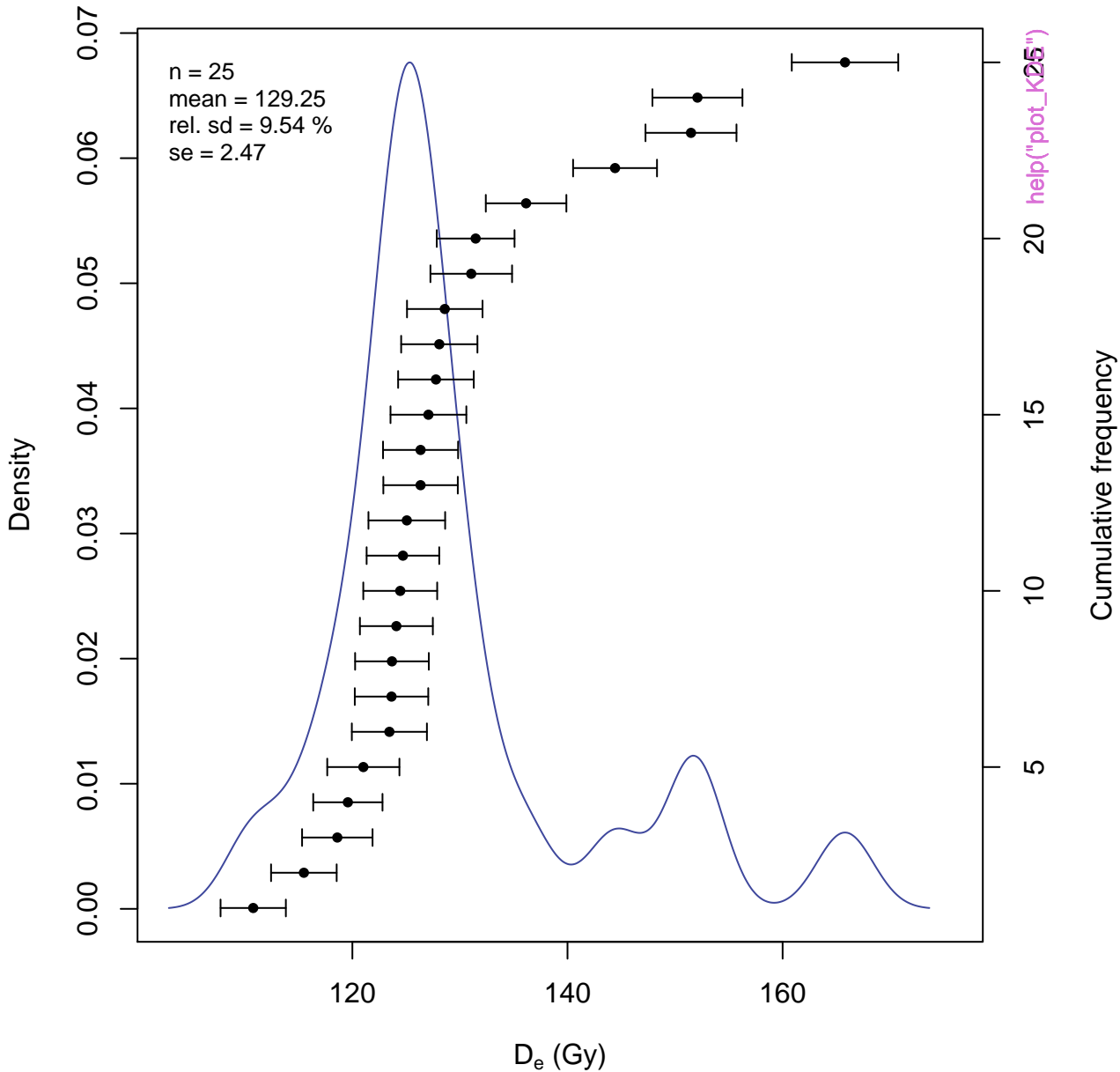


D_e distribution

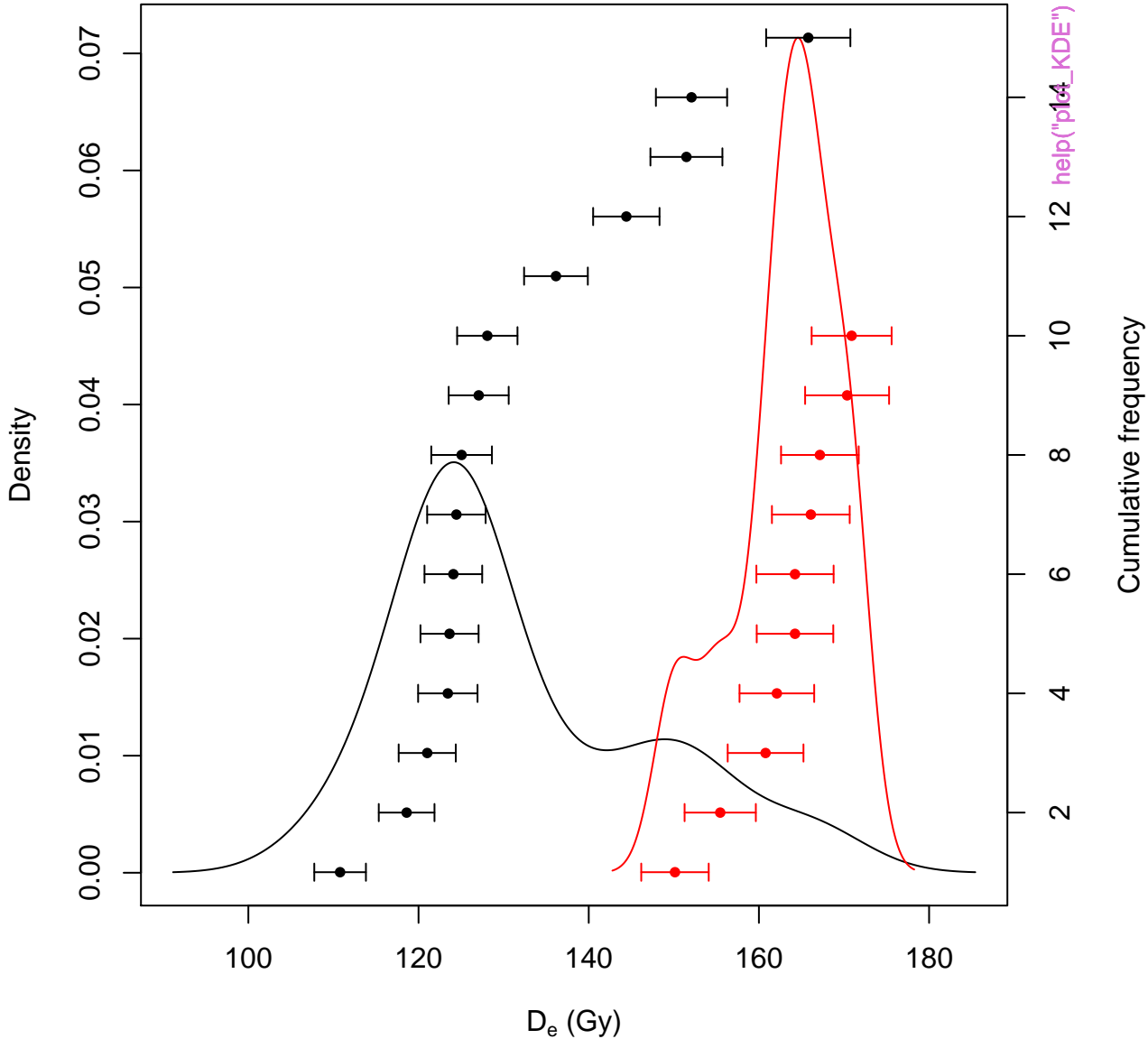
n = 25 | median = 126.34 | skewness = 1.34



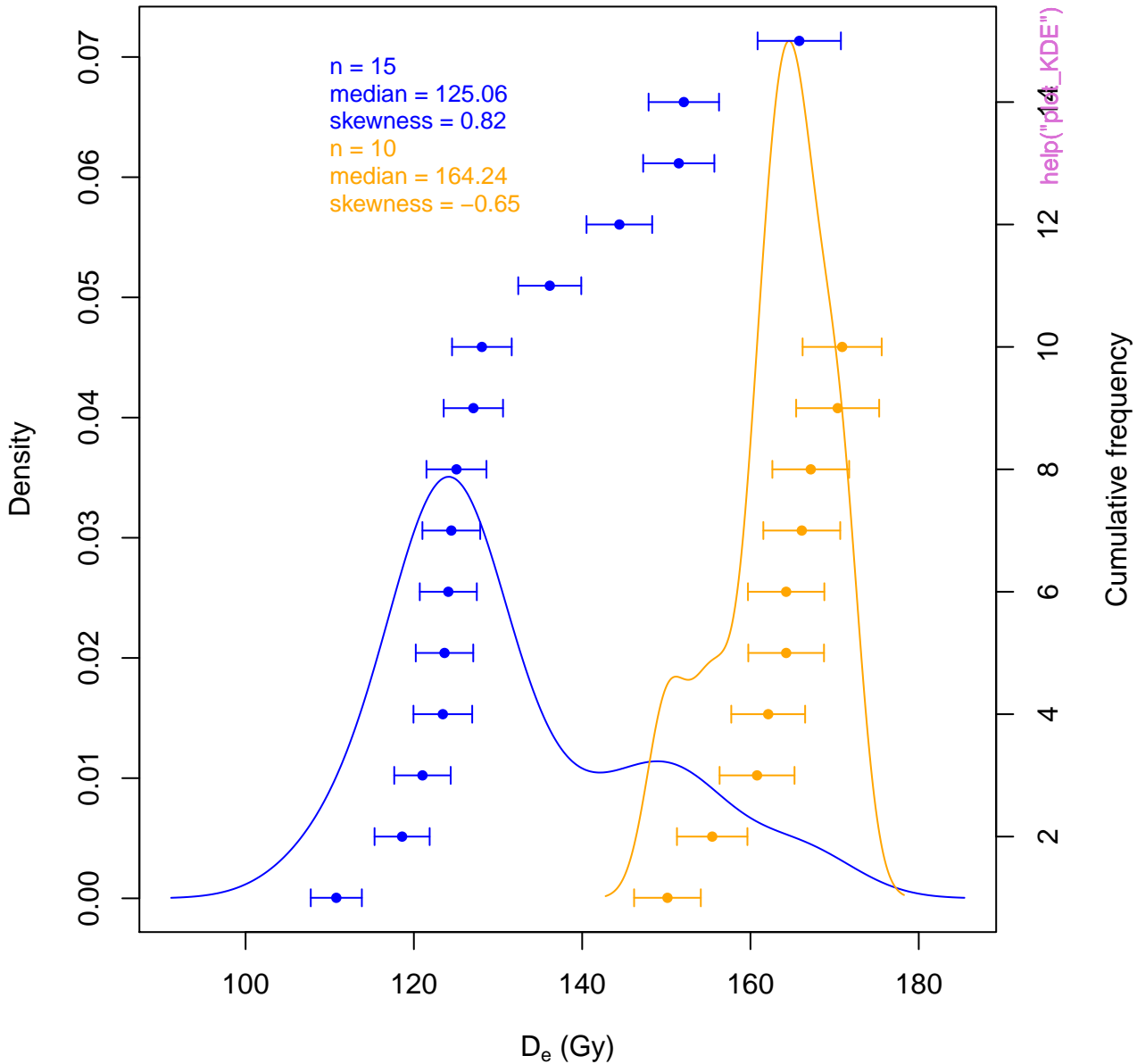
D_e distribution



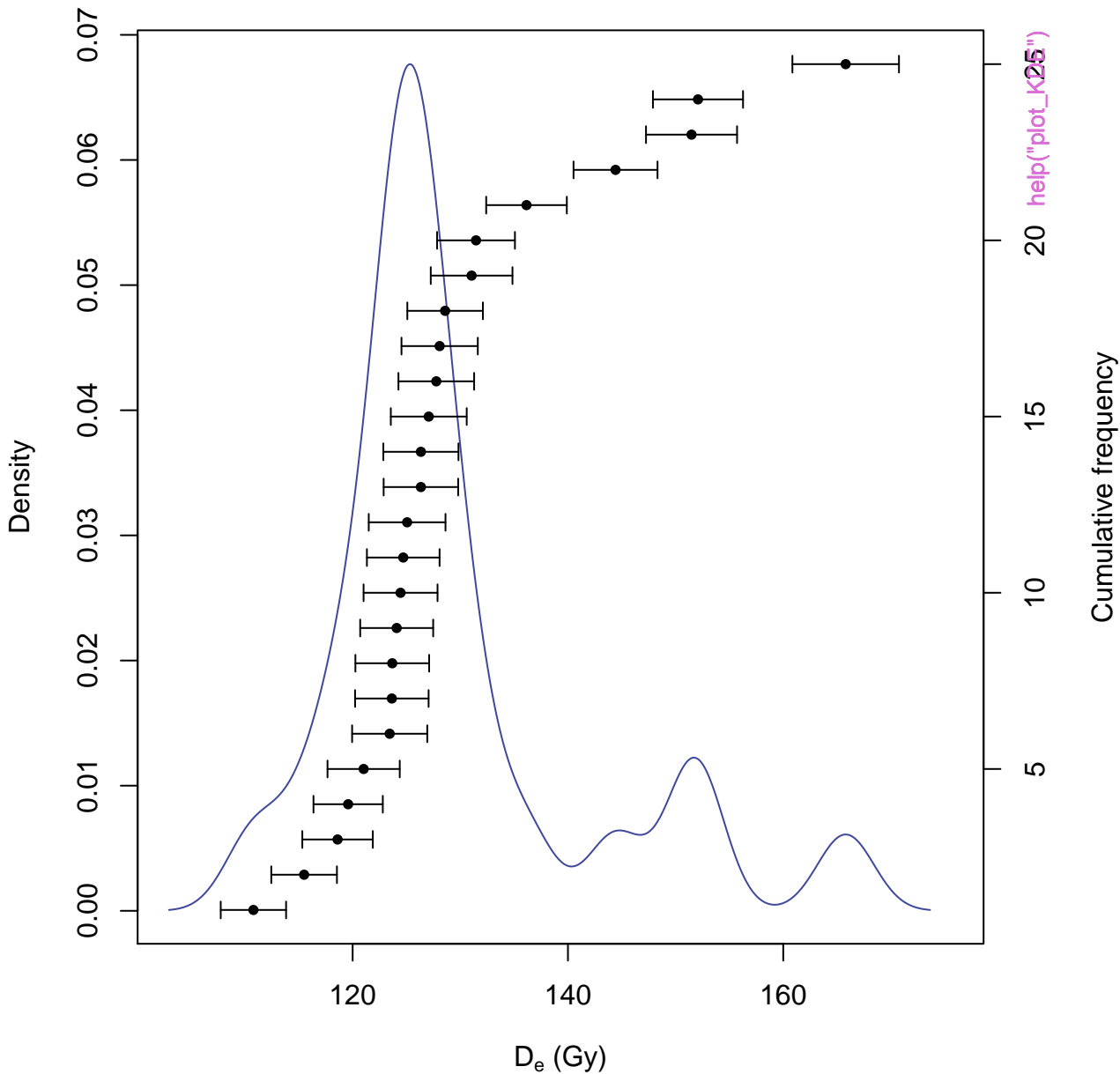
D_e distribution



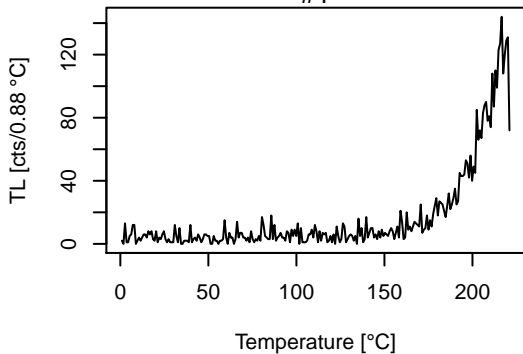
D_e distribution



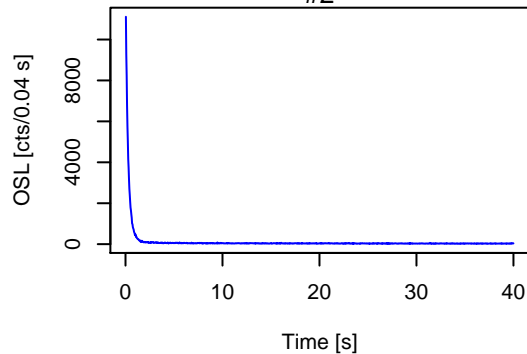
D_e distribution



TL
#1

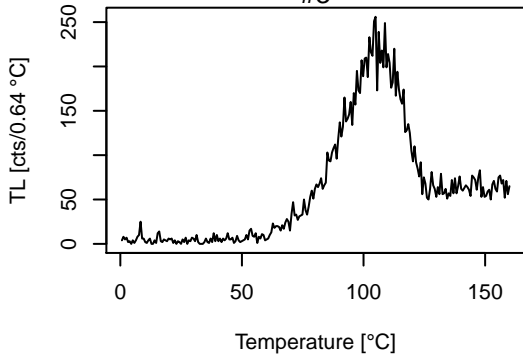


OSL
#2

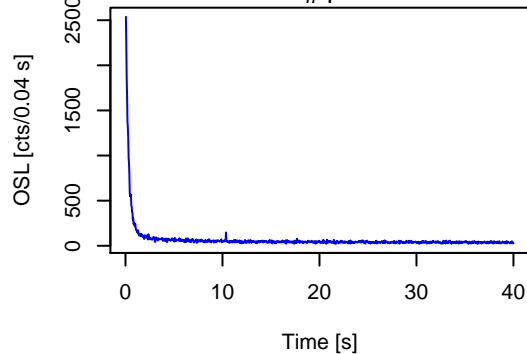


help("plot_RLum.Analysis")

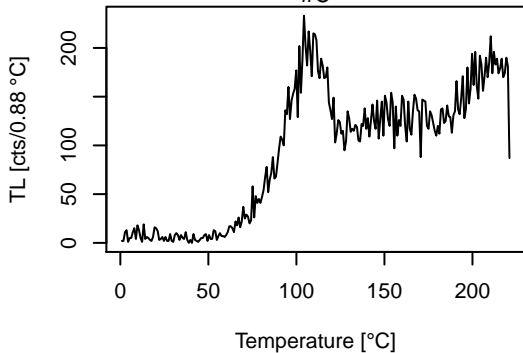
TL
#3



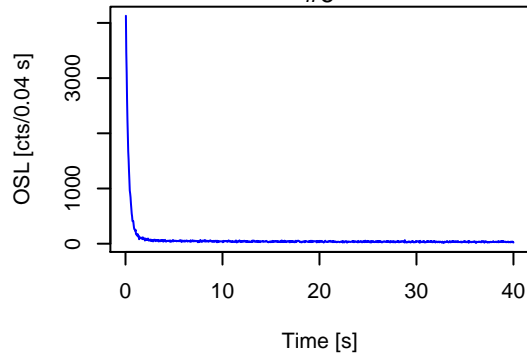
OSL
#4



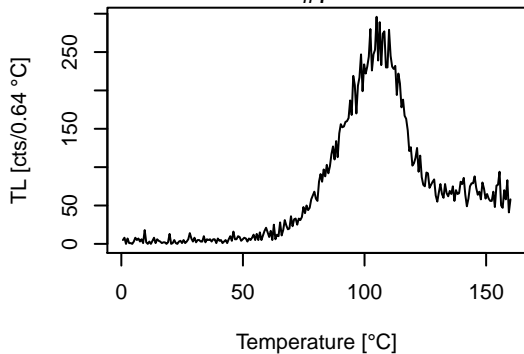
TL
#5



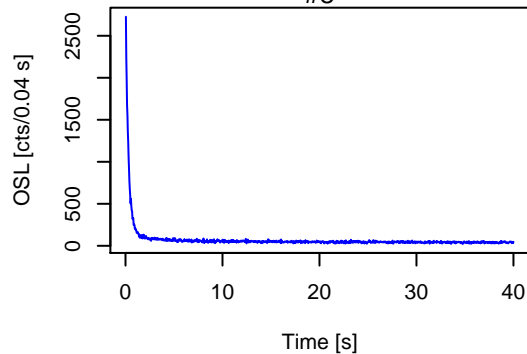
OSL
#6



TL
#7

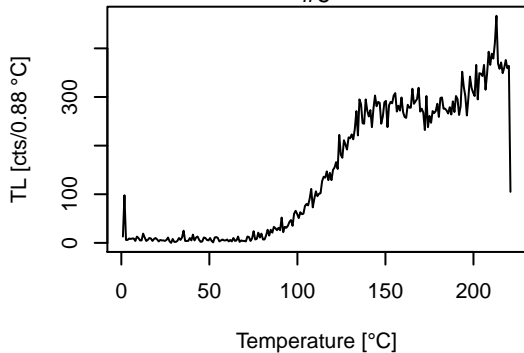


OSL
#8

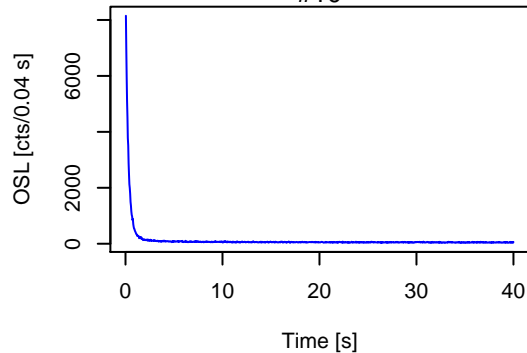


help("plot_RLum.Analysis")

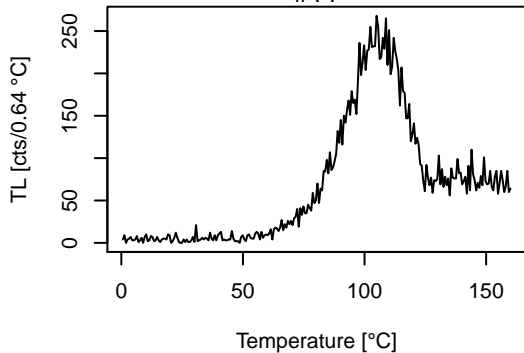
TL
#9



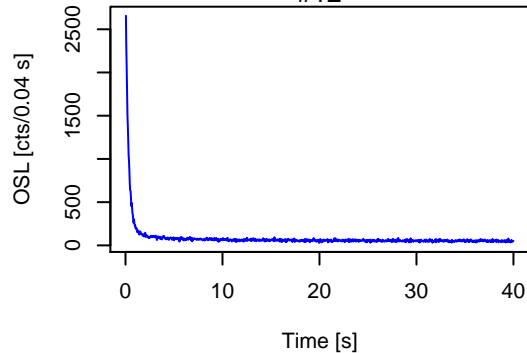
OSL
#10

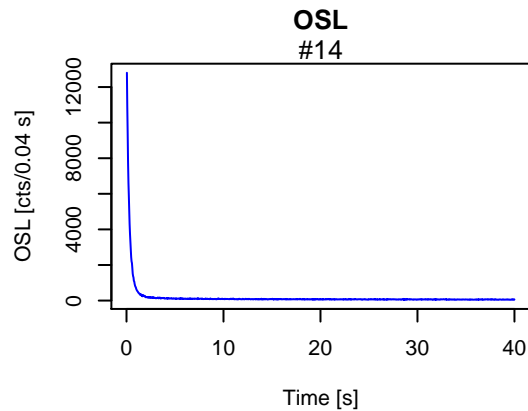
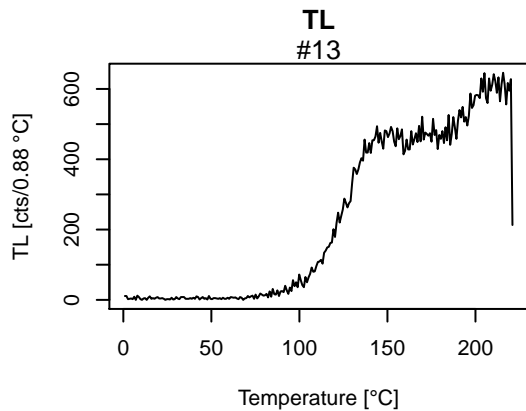


TL
#11

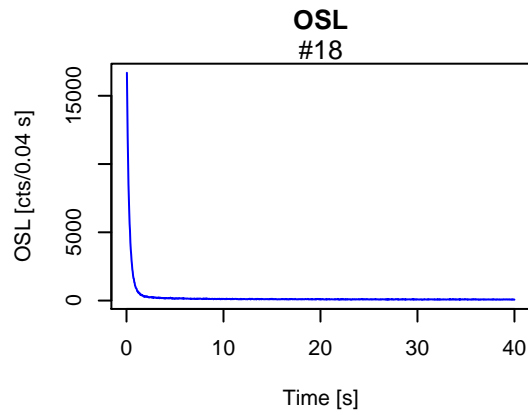
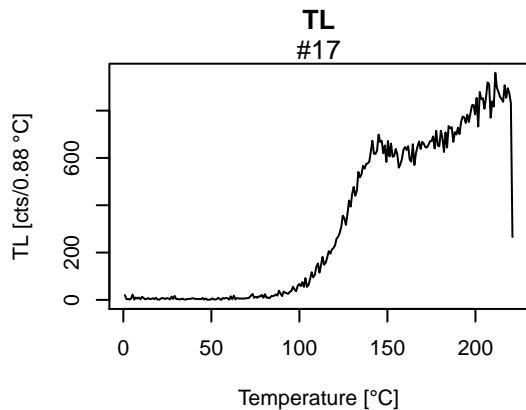
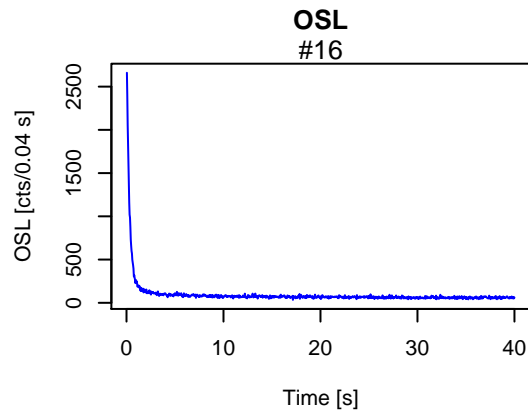
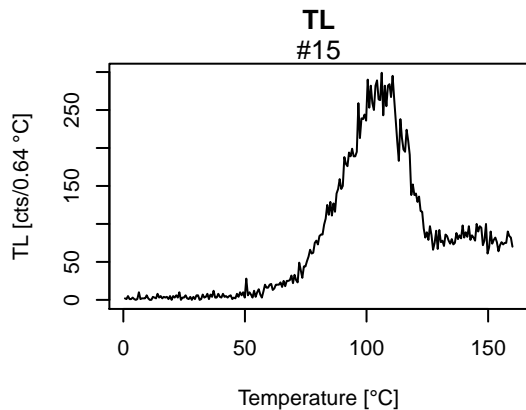


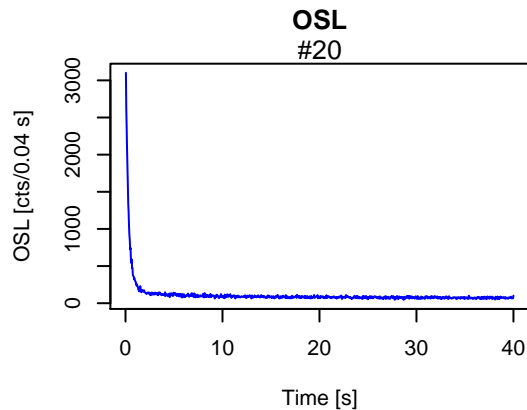
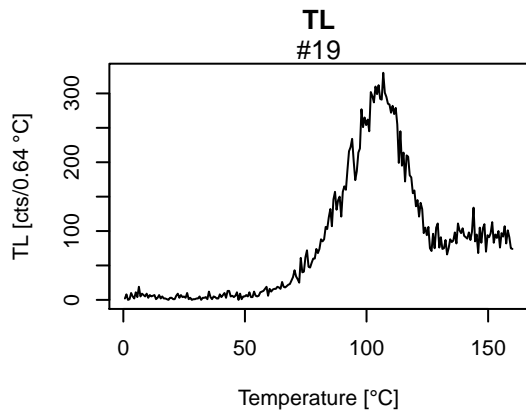
OSL
#12



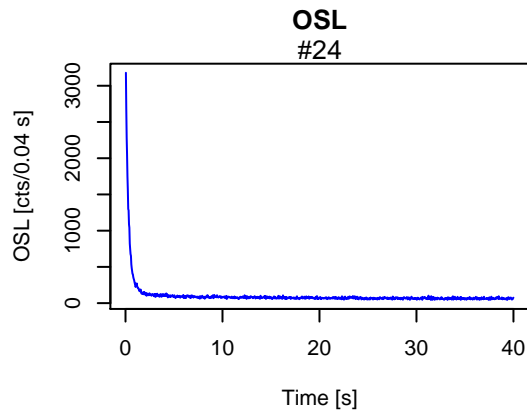
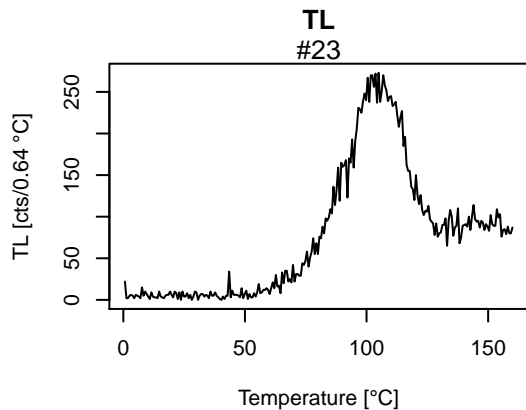
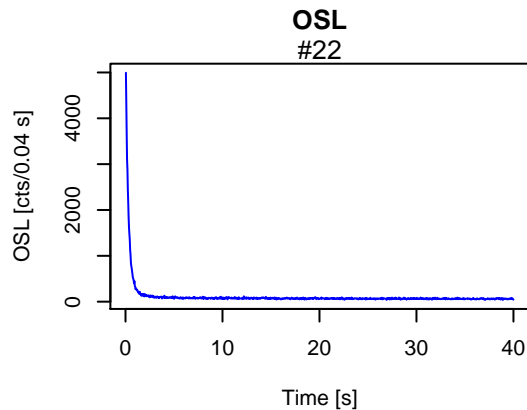
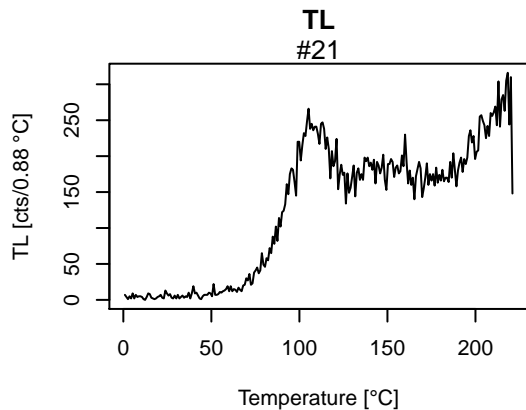


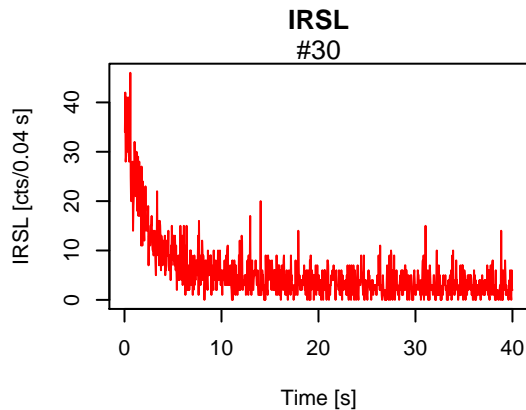
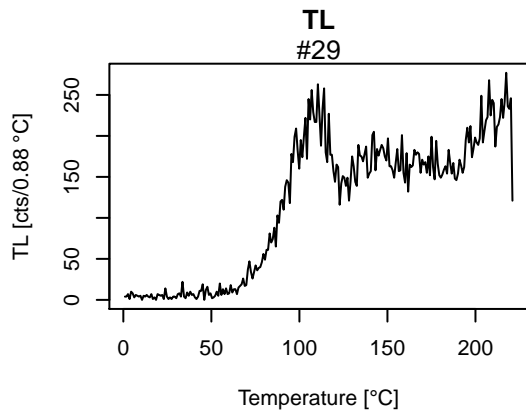
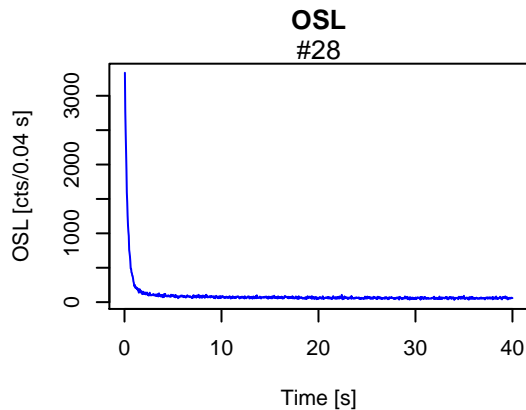
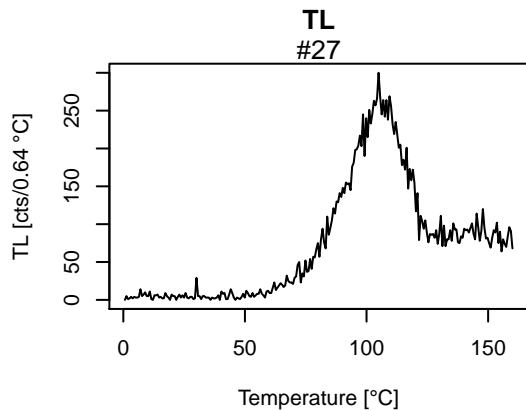
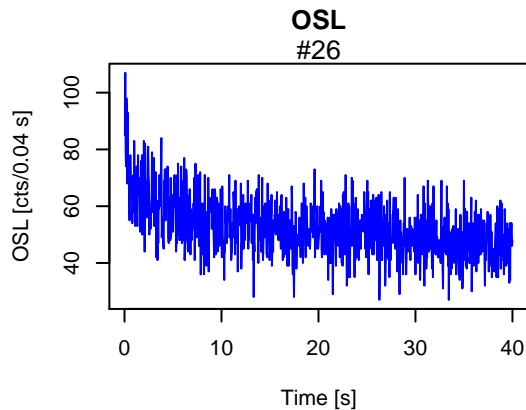
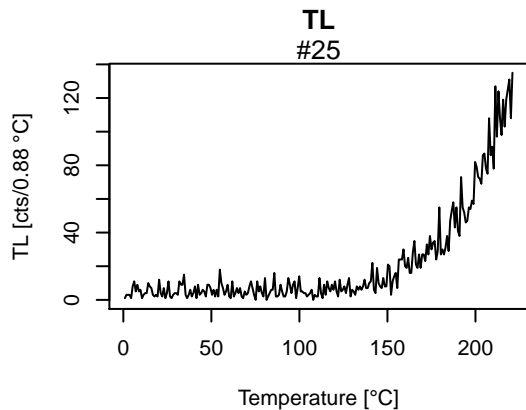
help("plot_RLum.Analysis")





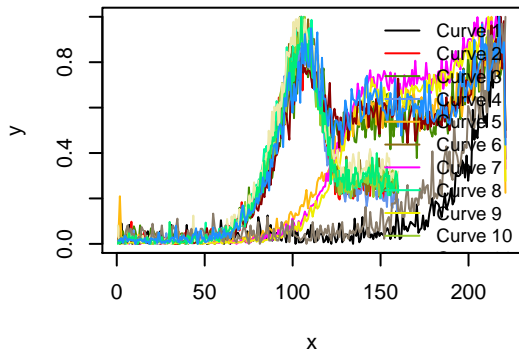
help("plot_RLum.Analysis")



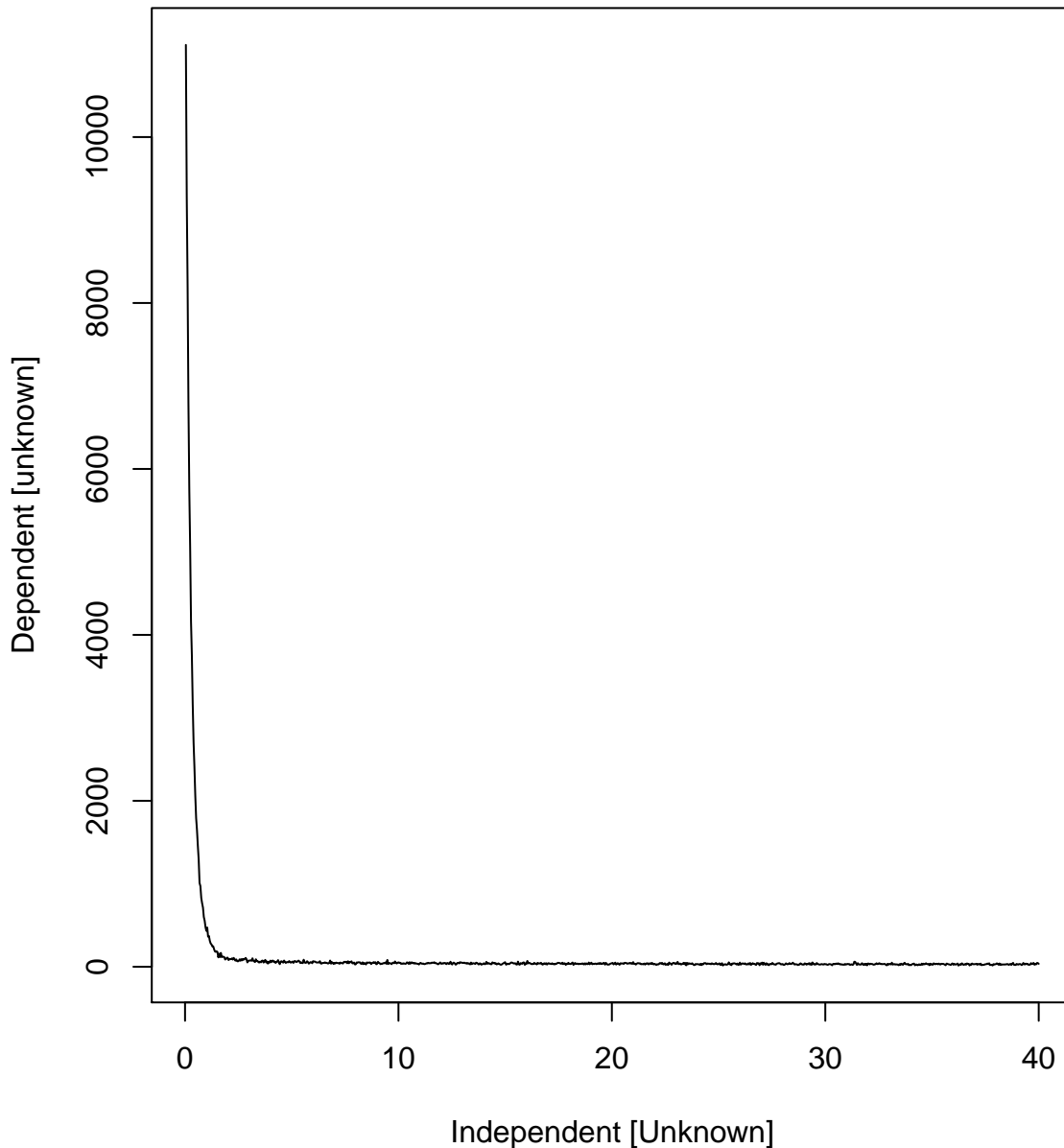


help("plot_RLum.Analysis")

TL combined

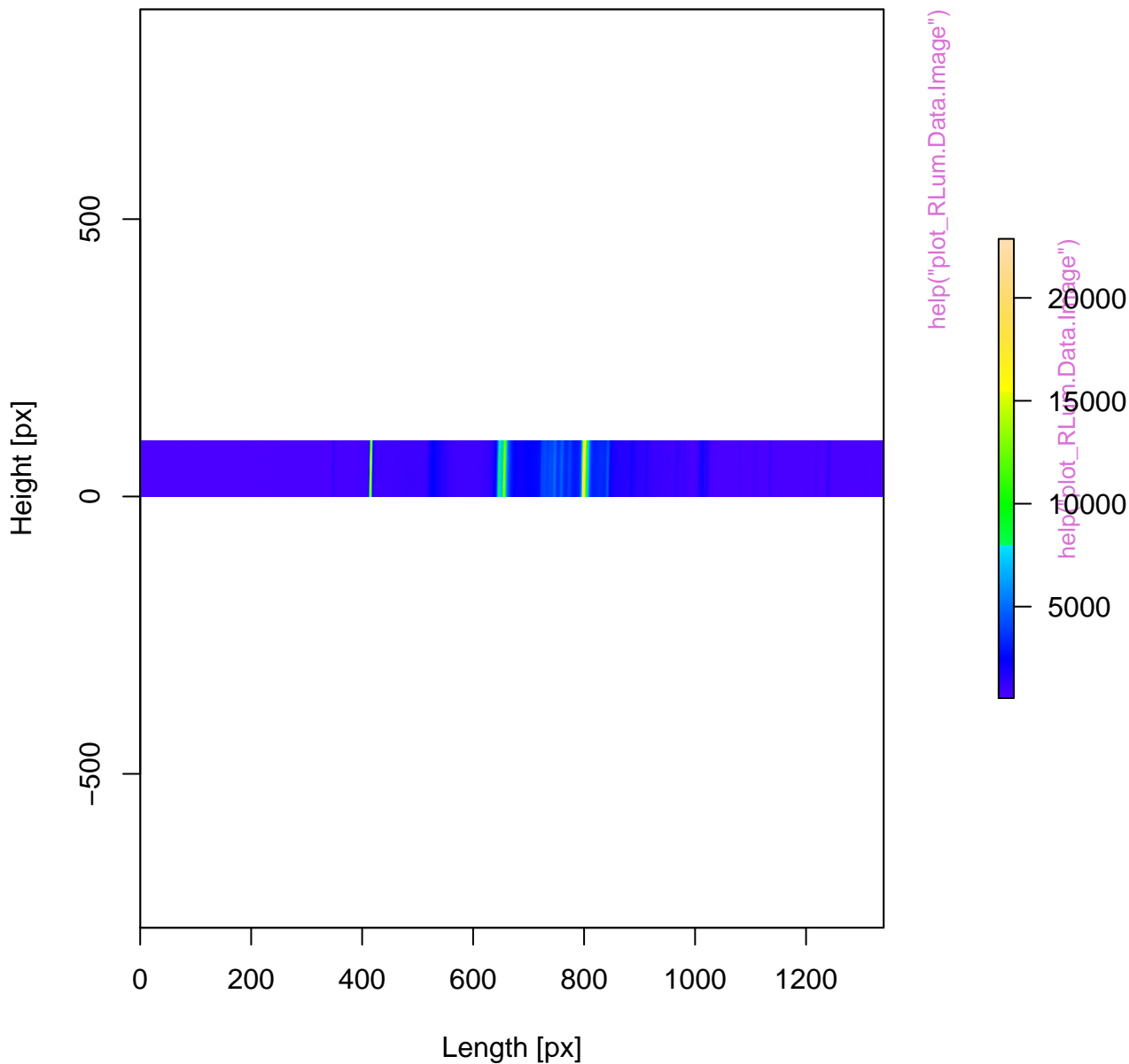


unkown curve type

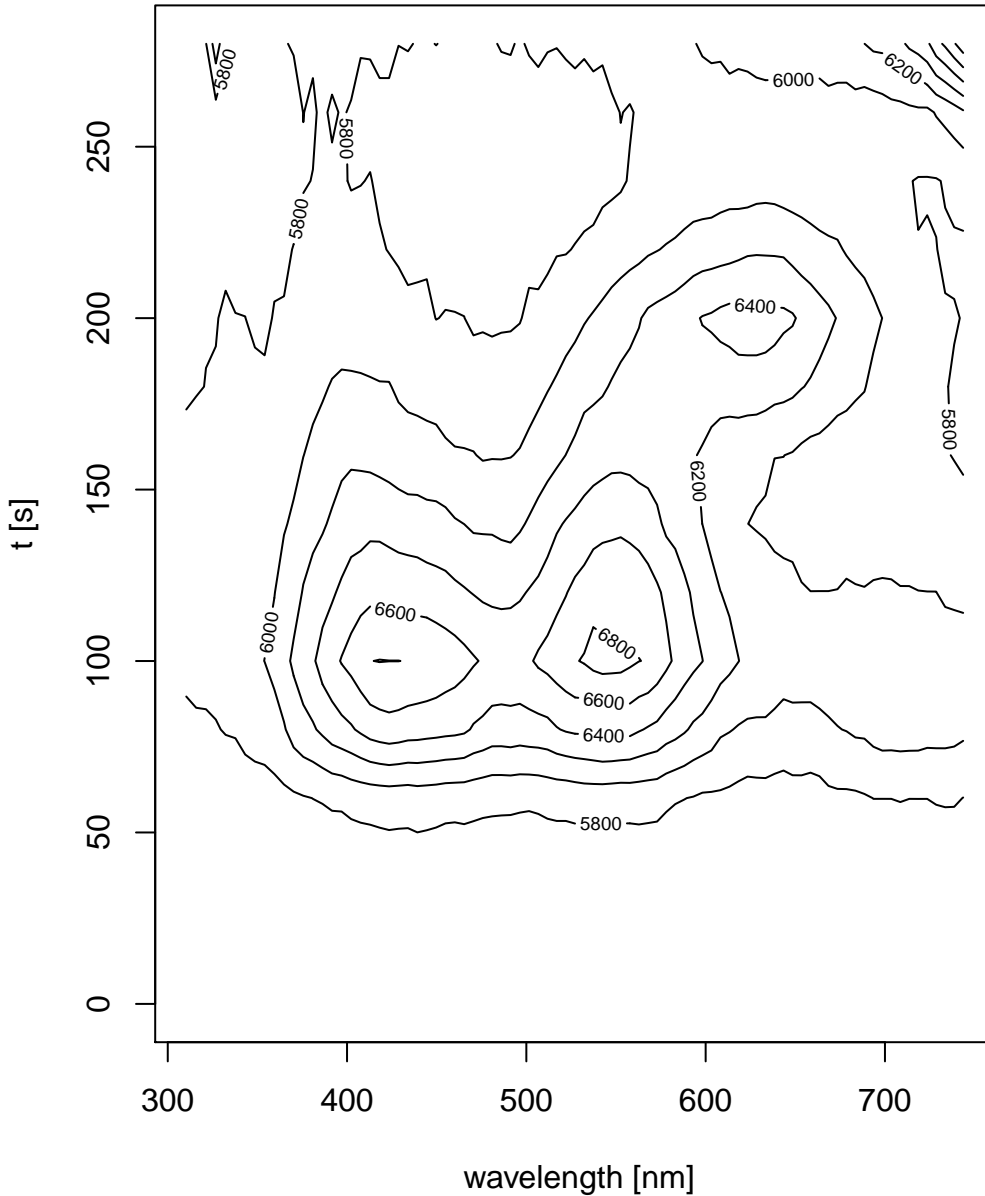


[help\("plot_RLum.Data.Curve"\)](#)

RLum.Data.Image

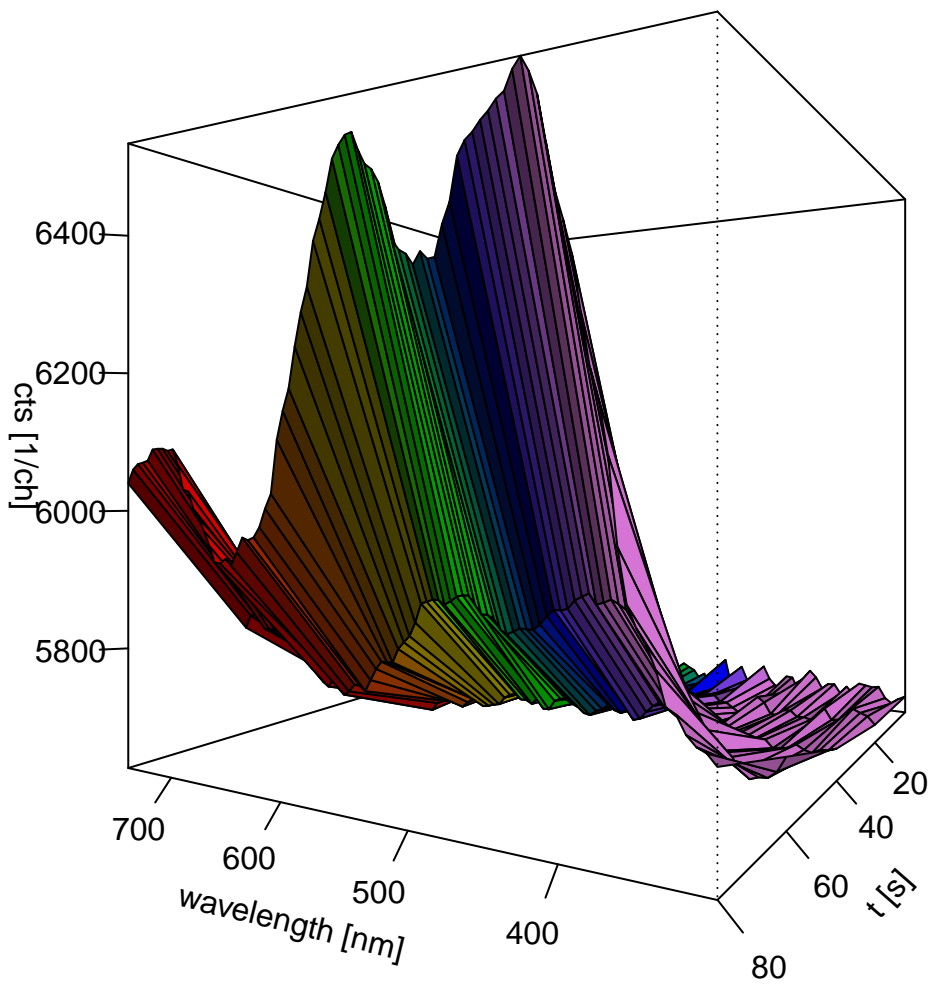


RLum.Data.Spectrum



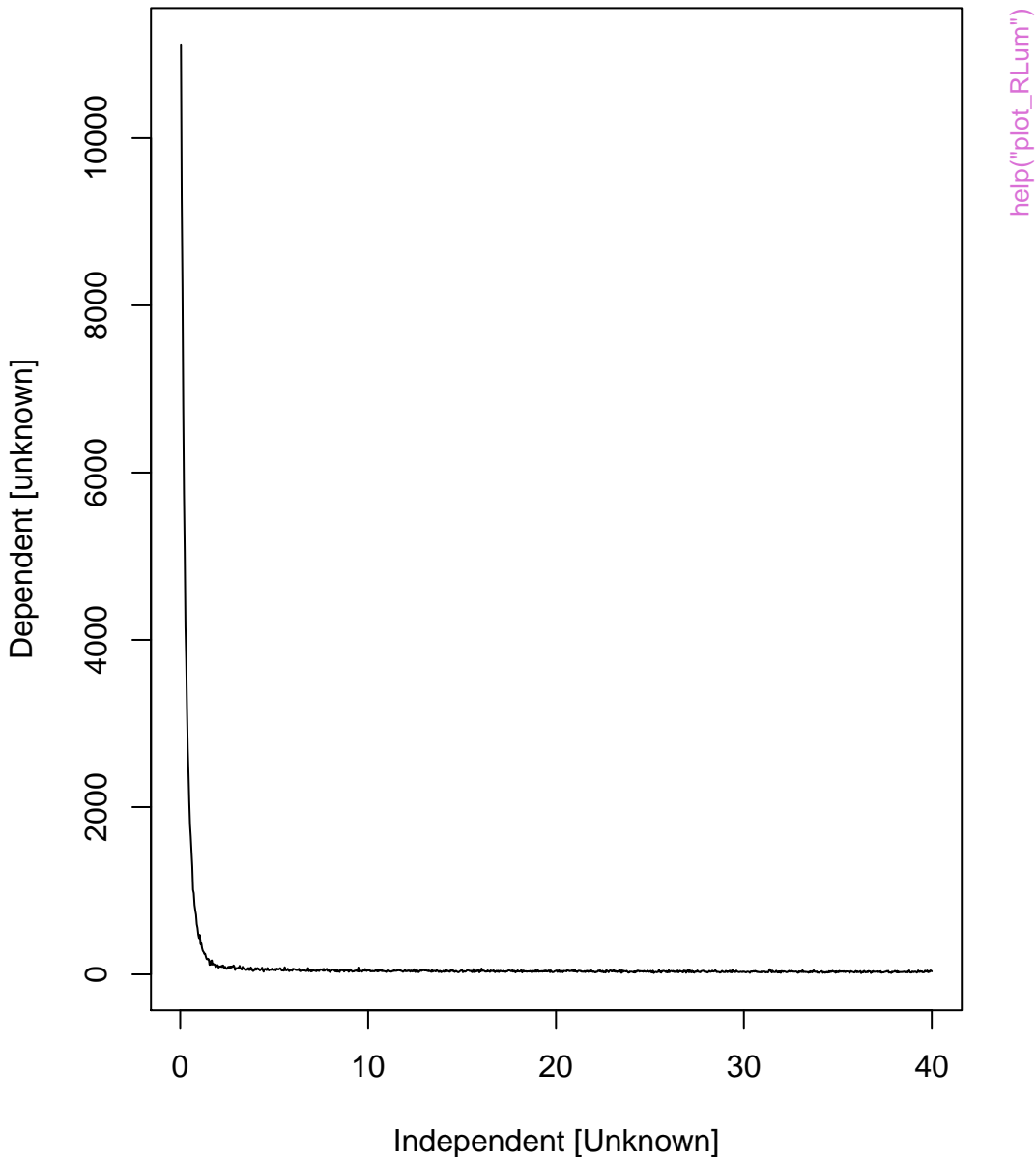
[help\("plot_RLum.Data.Spectrum"\)](#)

RLum.Data.Spectrum

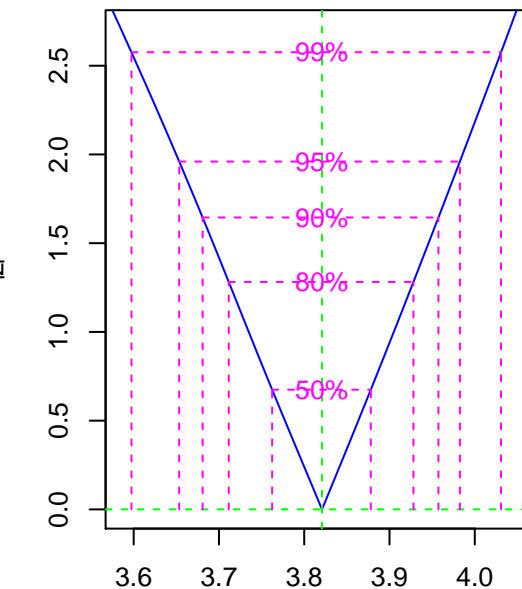


[help\("plot_RLum.Data.Spectrum"\)](#)

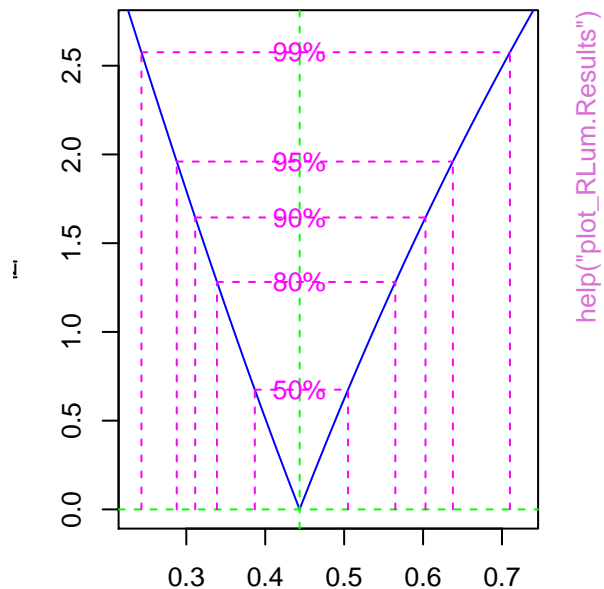
unkown curve type



Likelihood profile: gamma

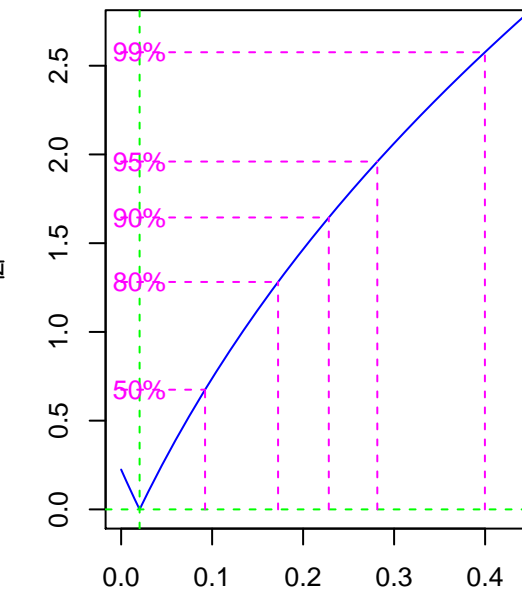


Likelihood profile: sigma



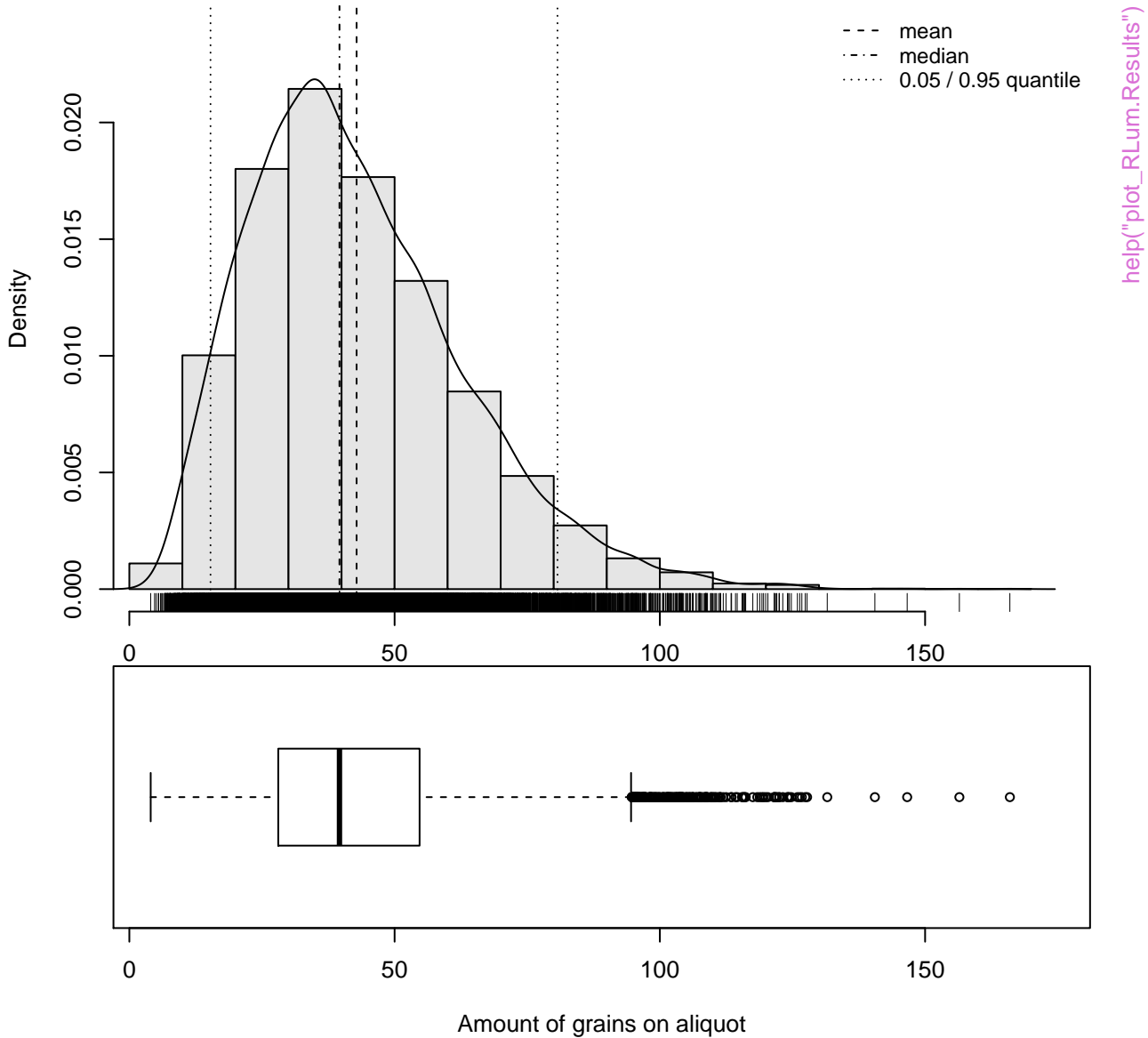
help("plot_RLum.Results")

Likelihood profile: p0



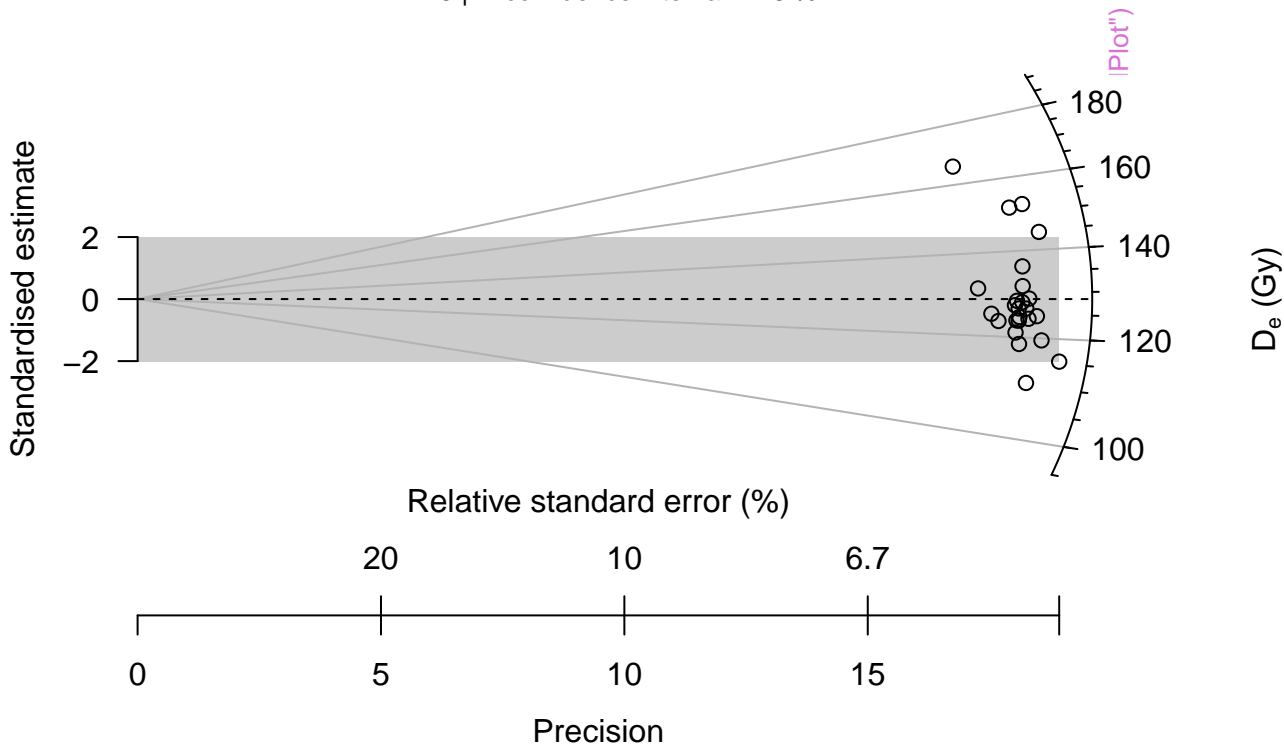
Monte Carlo Simulation

$n = 10000 \mid \hat{\mu} = 43 \mid \hat{\sigma} = 20 \mid \frac{\hat{\sigma}}{\sqrt{n}} = 0 \mid v = 0.85$



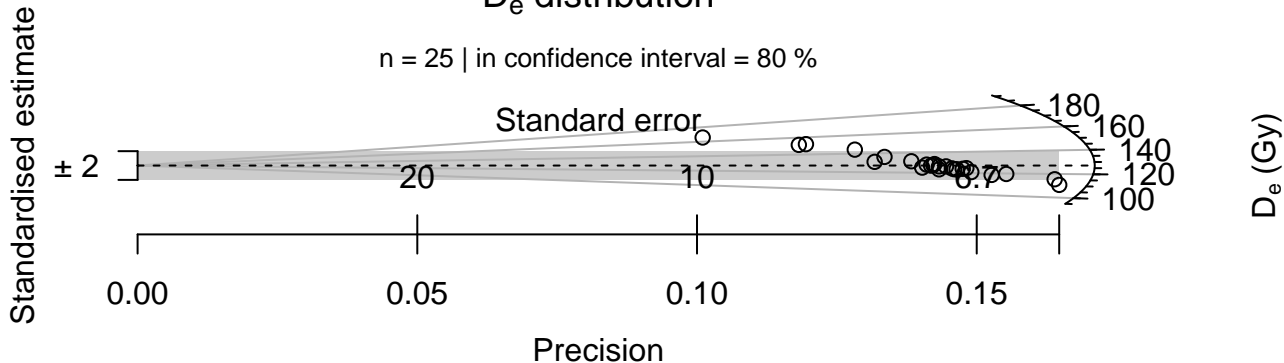
D_e distribution

n = 25 | in confidence interval = 76 %



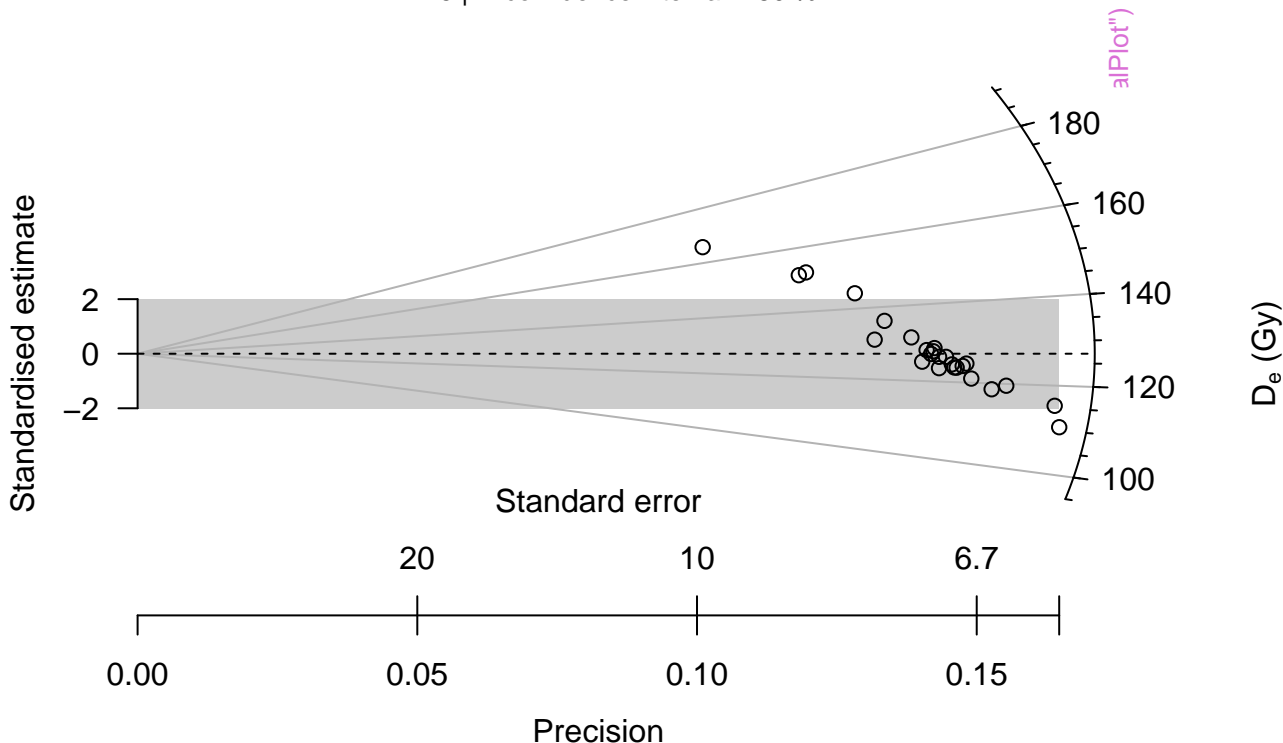
D_e distribution

n = 25 | in confidence interval = 80 %



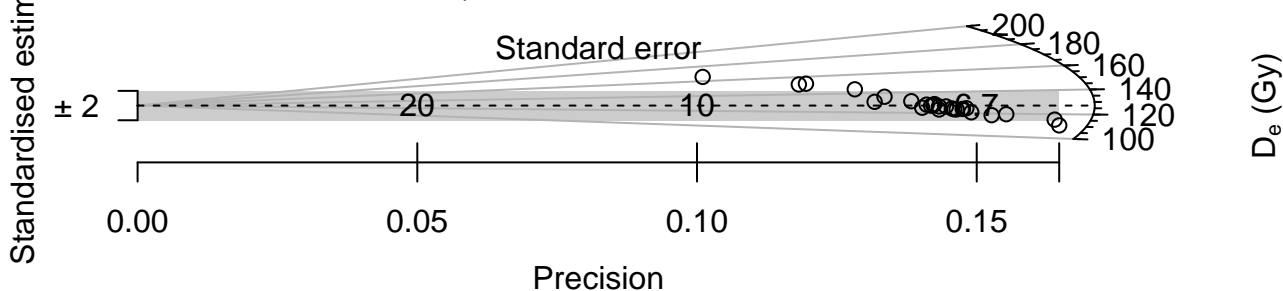
D_e distribution

n = 25 | in confidence interval = 80 %



D_e distribution

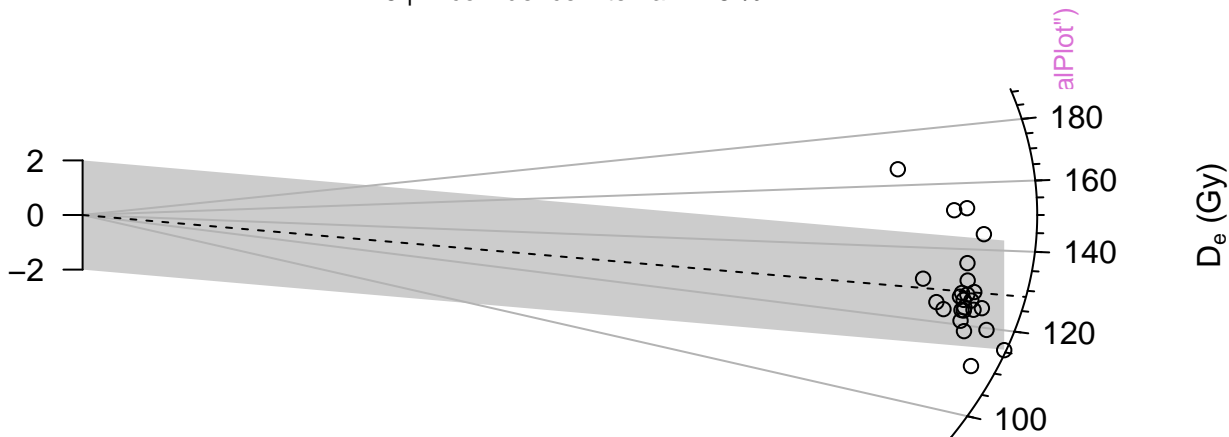
n = 25 | in confidence interval = 80 %



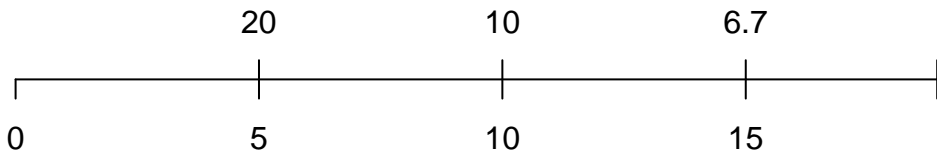
D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



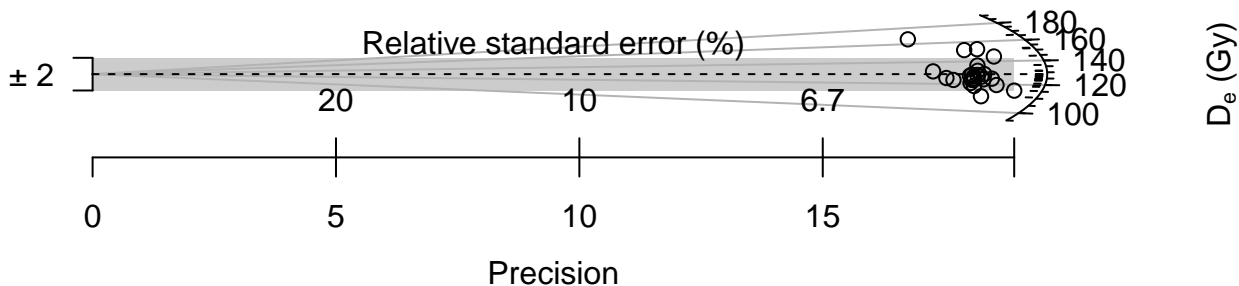
Relative standard error (%)



D_e distribution

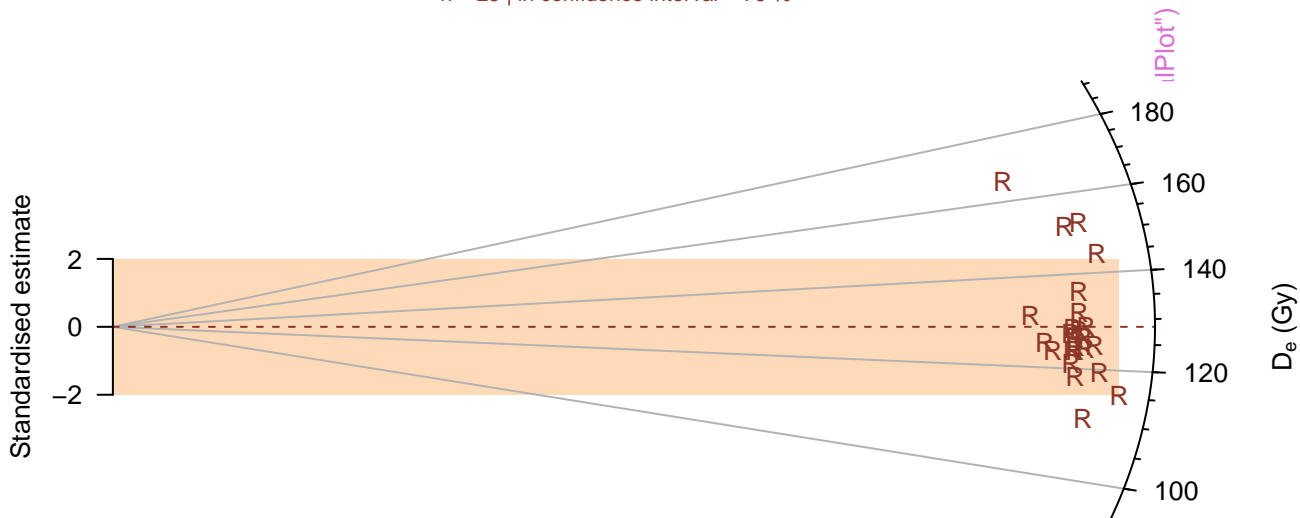
n = 25 | in confidence interval = 76 %

Standardised estimate

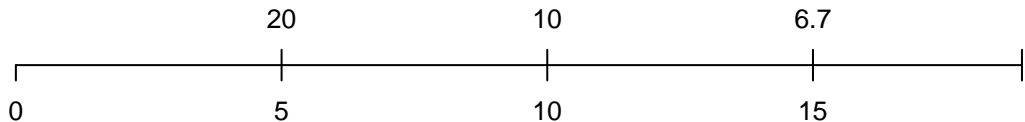


D_e distribution

n = 25 | in confidence interval = 76 %



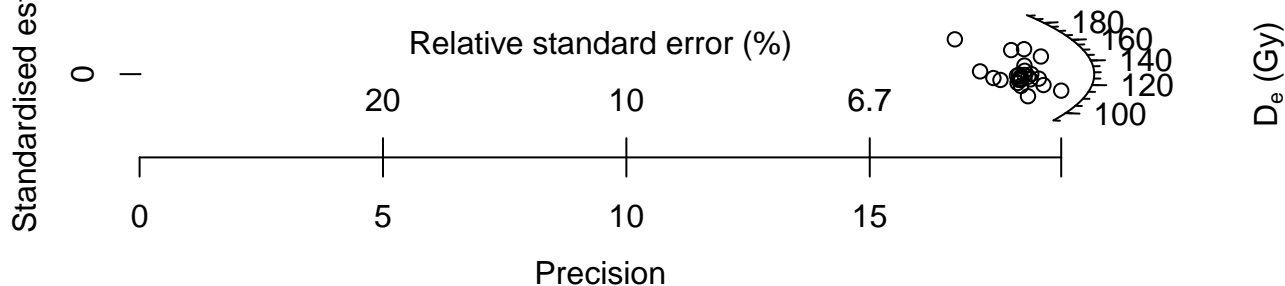
Relative standard error (%)



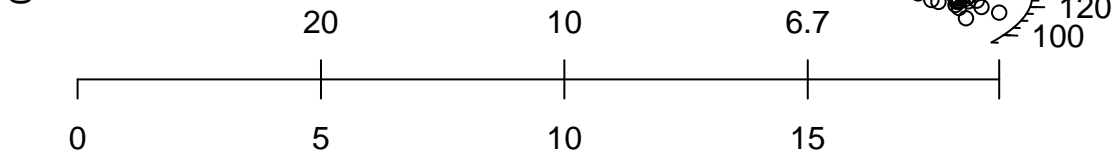
Precision

D_e distribution

n = 25 | in confidence interval = 76 %



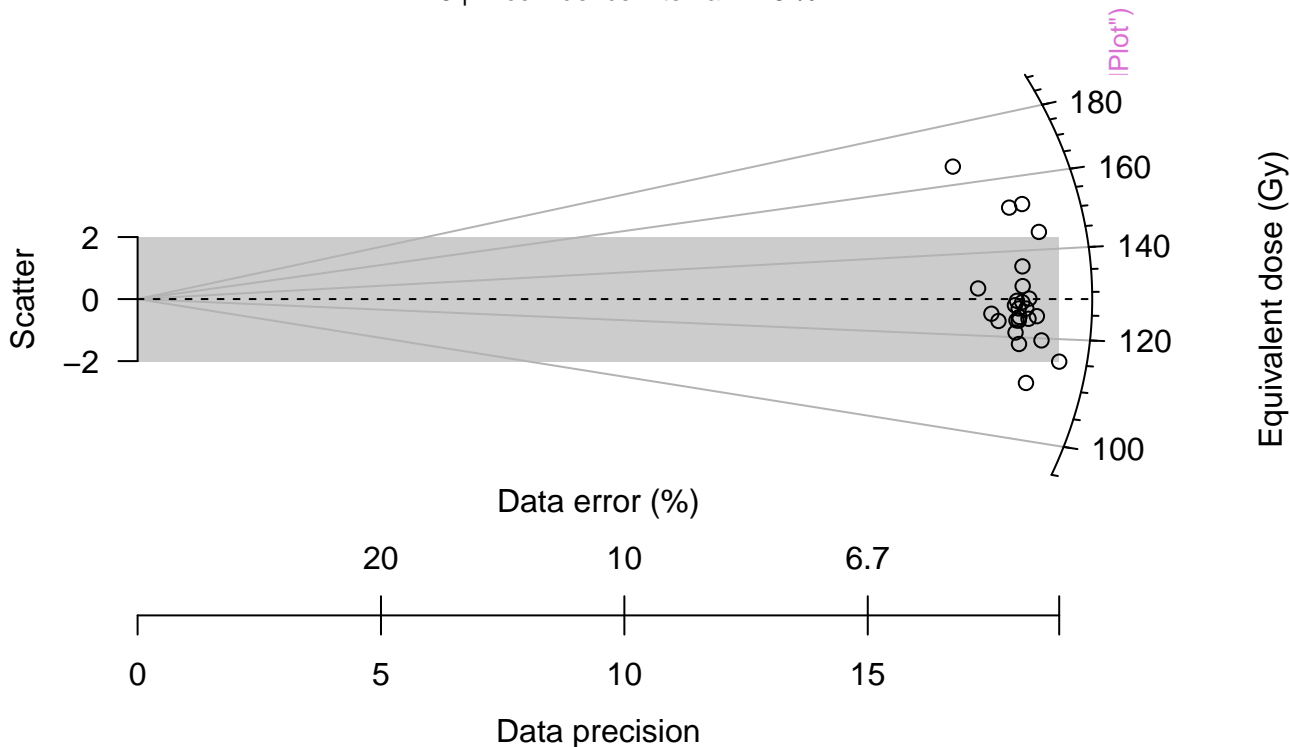
Relative standard error (%)



Precision

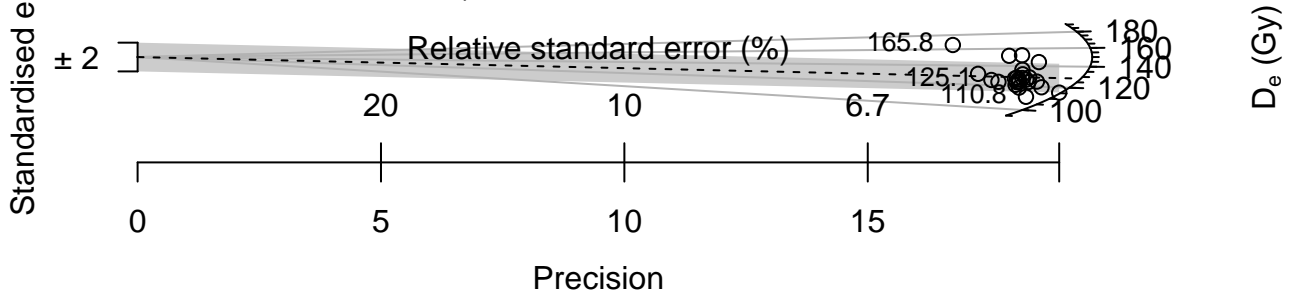
D_e distribution

n = 25 | in confidence interval = 76 %



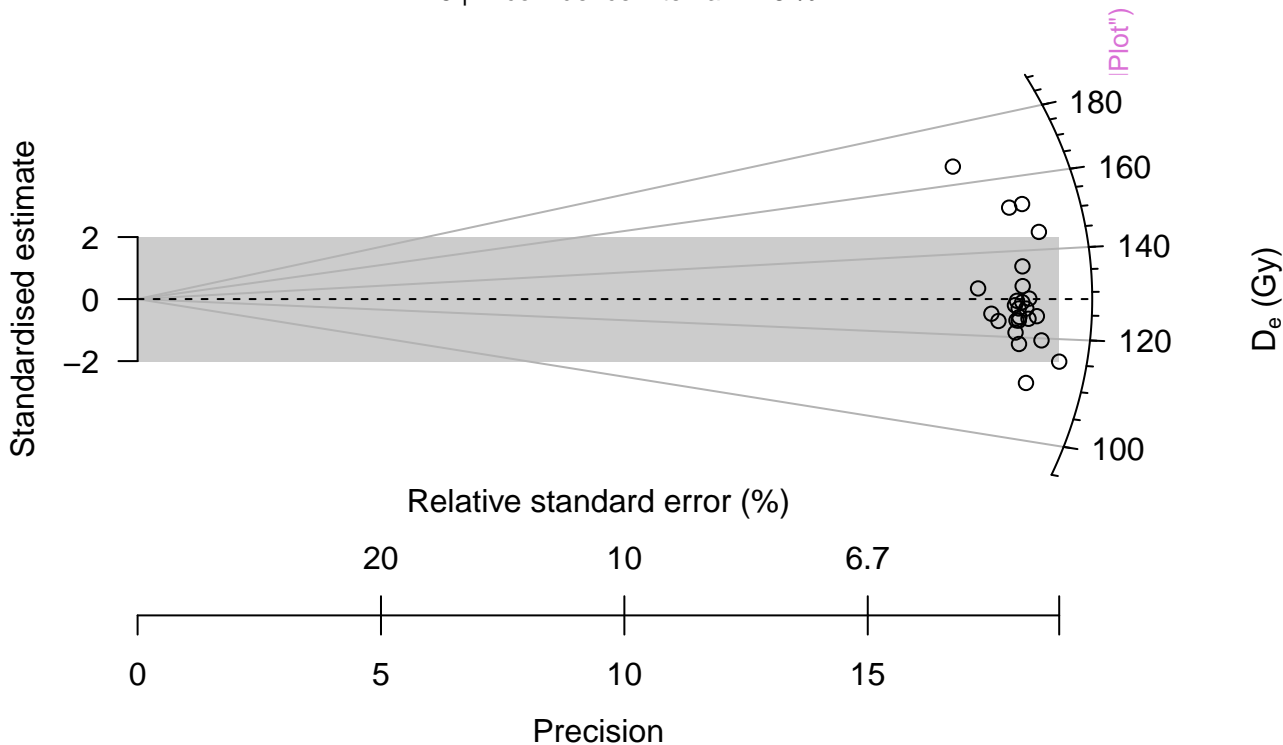
D_e distribution

n = 25 | in confidence interval = 76 %



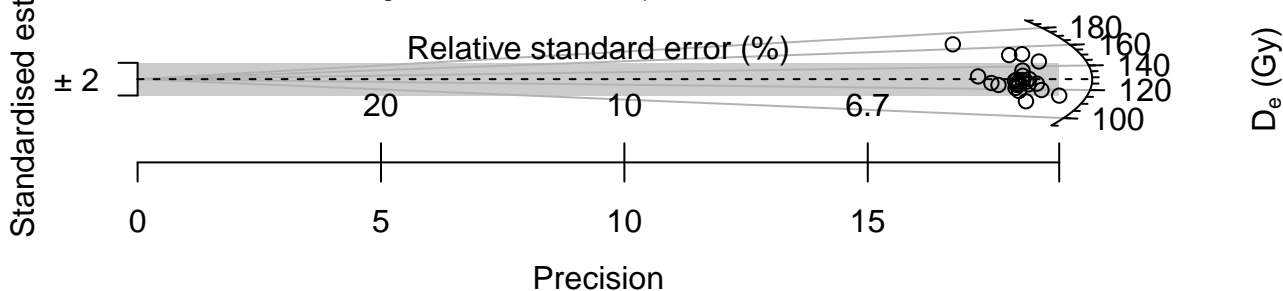
D_e distribution

n = 25 | in confidence interval = 76 %



D_e distribution

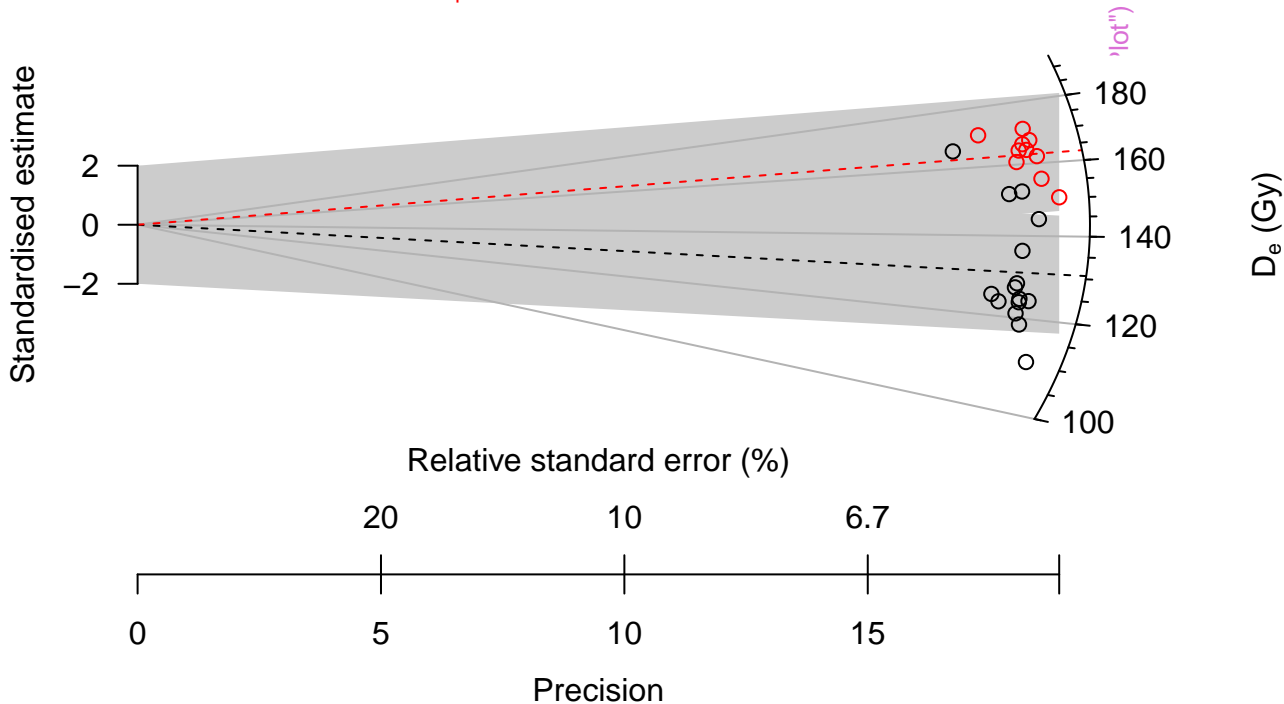
weighted mean = 128.12 | median = 126.34



D_e distribution

n = 15 | in confidence interval = 73.3 %

n = 10 | in confidence interval = 100 %



D_e distribution

n = 15 | in confidence interval = 73.3 %

n = 10 | in confidence interval = 100 %

