

L_n, L_x curves

ALQ Pos. 1

T_n, T_x curves



help("Analyse_SAR OSLdata")

unknown measurement

Cutheat – TL curves



IRSLT

IRSL/BOSL = 0.88%



IRSL curve (10 s)







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)



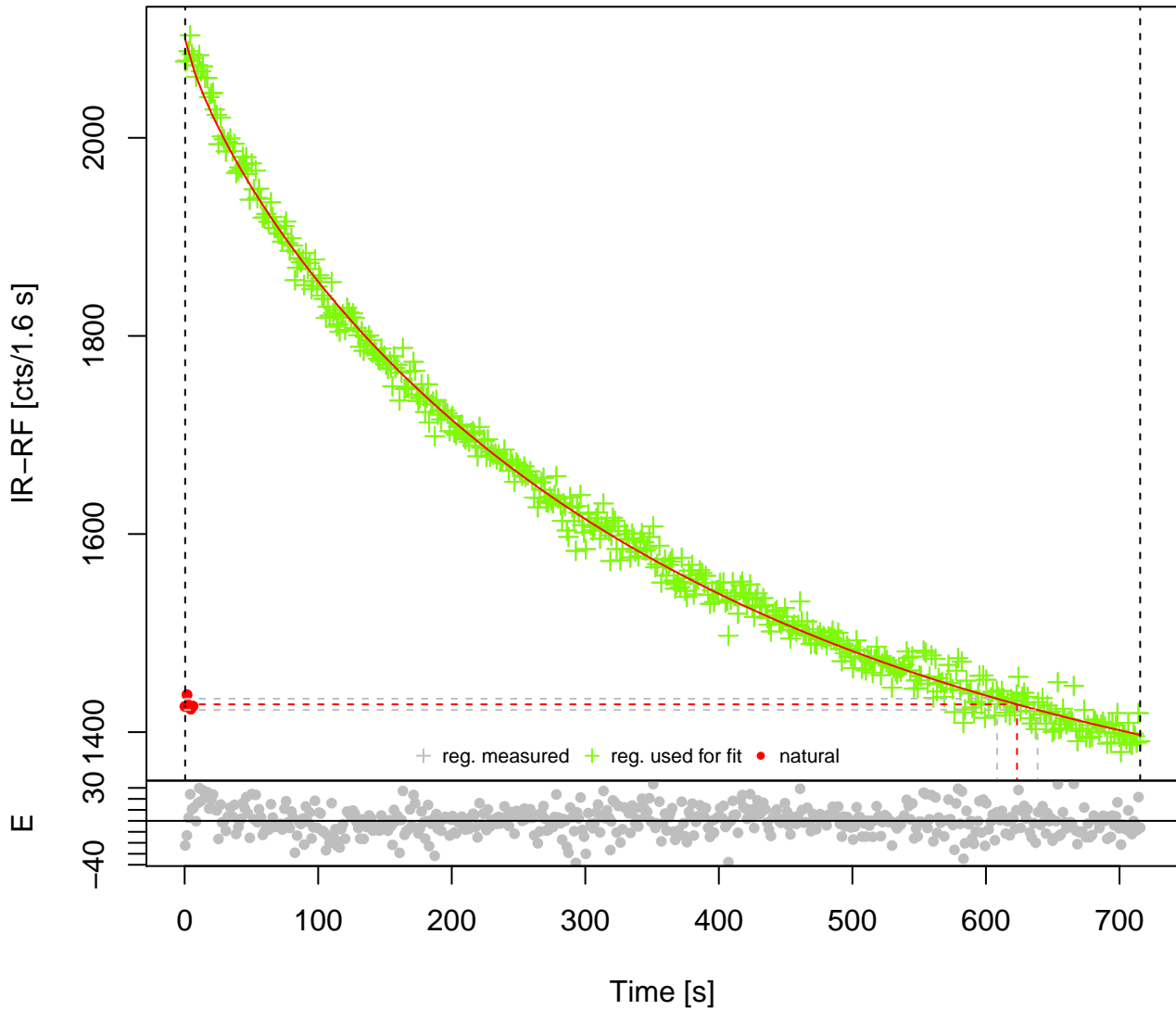
help("ExampleData.XSYG")

RLum.Data.Spectrum



help("ExampleData.XSYG")

IR-RF

$$D_e = 623.25 \text{ (608.39 638.67)}$$


TL previous L_n, L_x curves



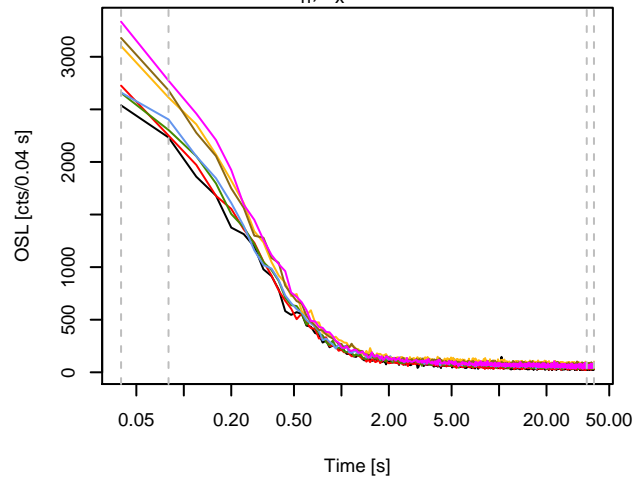
TL previous T_n, T_x curves



L_n, L_x curves



T_n, T_x curves



●
Natural
(0)

●
R1
(450)

●
R2
(1050)

●
R3
(2000)

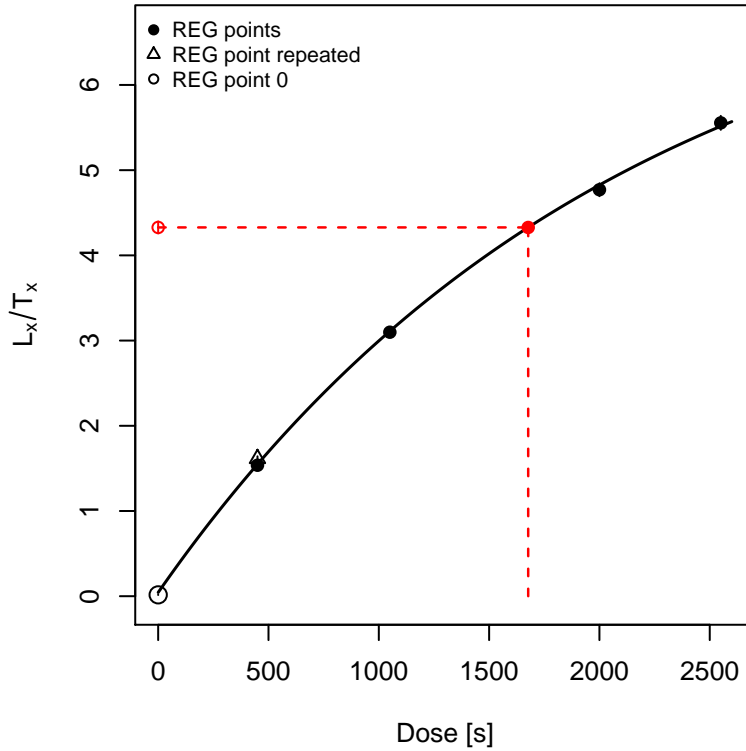
●
R4
(2550)

●
R5
(450)

●
R0
(0)

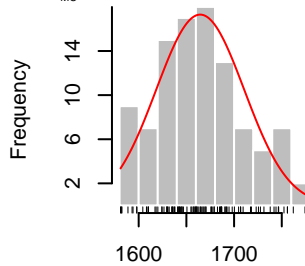
Growth curve

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

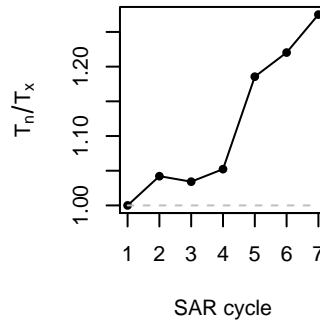


D_e from MC simulation

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



Test dose response



Rejection criteria

Recycling ratio



Recuperation rate



Palaeodose error



- 0.2 + 0.2

IRSL

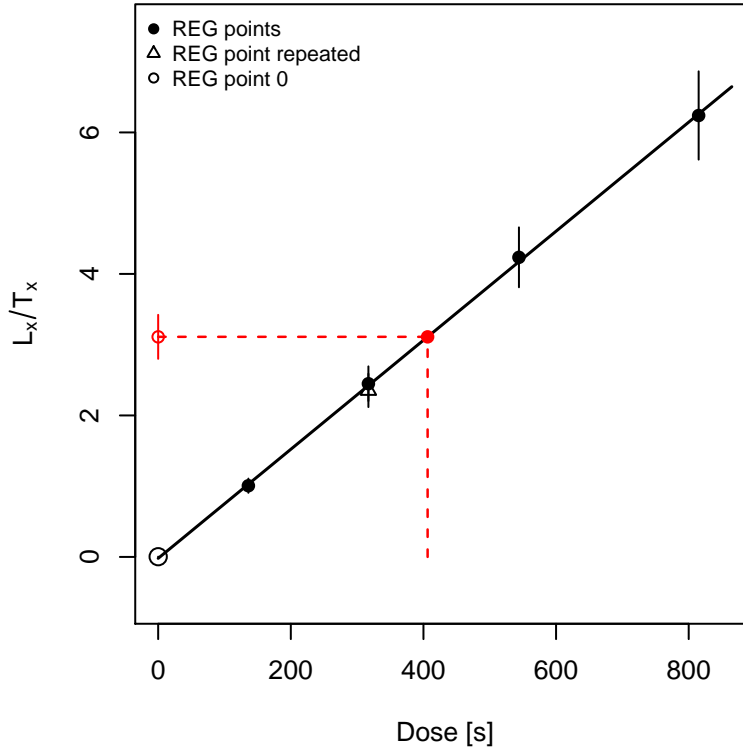


`help("analyse_SAR.CWOSL")`

L_n, L_x curves T_n, T_x curvesPlateau test L_n, L_x curvesplateau Test T_n, T_x curves

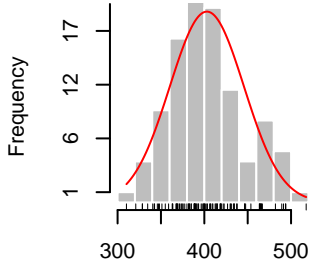
Growth curve

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

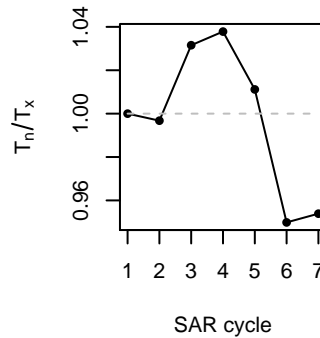


D_e from MC simulation

$D_{eMC} = 402.95 \pm 42.81$ | 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



Pseudo pIRIR data set based on quartz OSL



Pseudo pIRIR data set based on quartz OSL

TL previous T_n, T_x curves



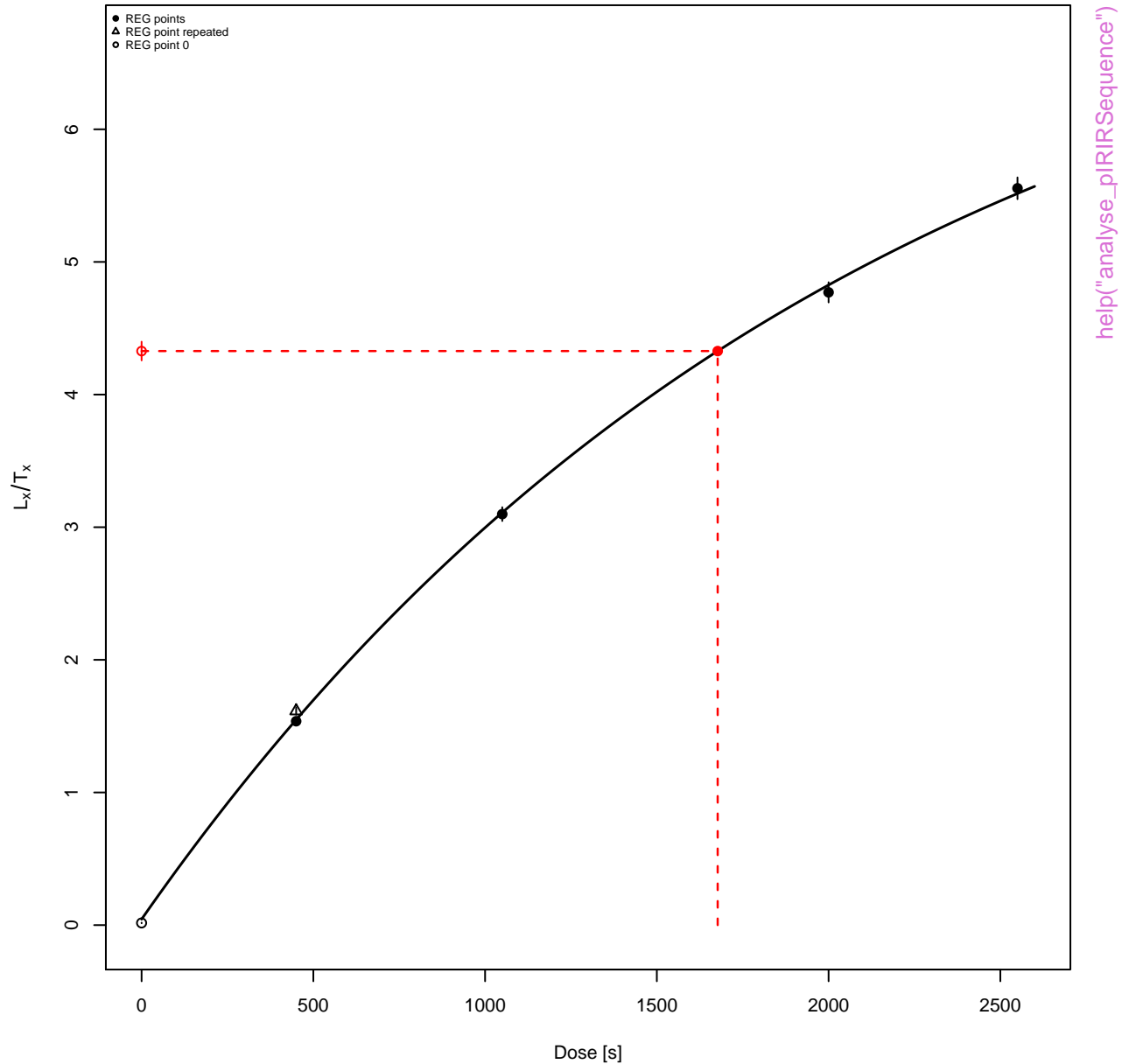
help("analyse_pIRIRSequence")

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



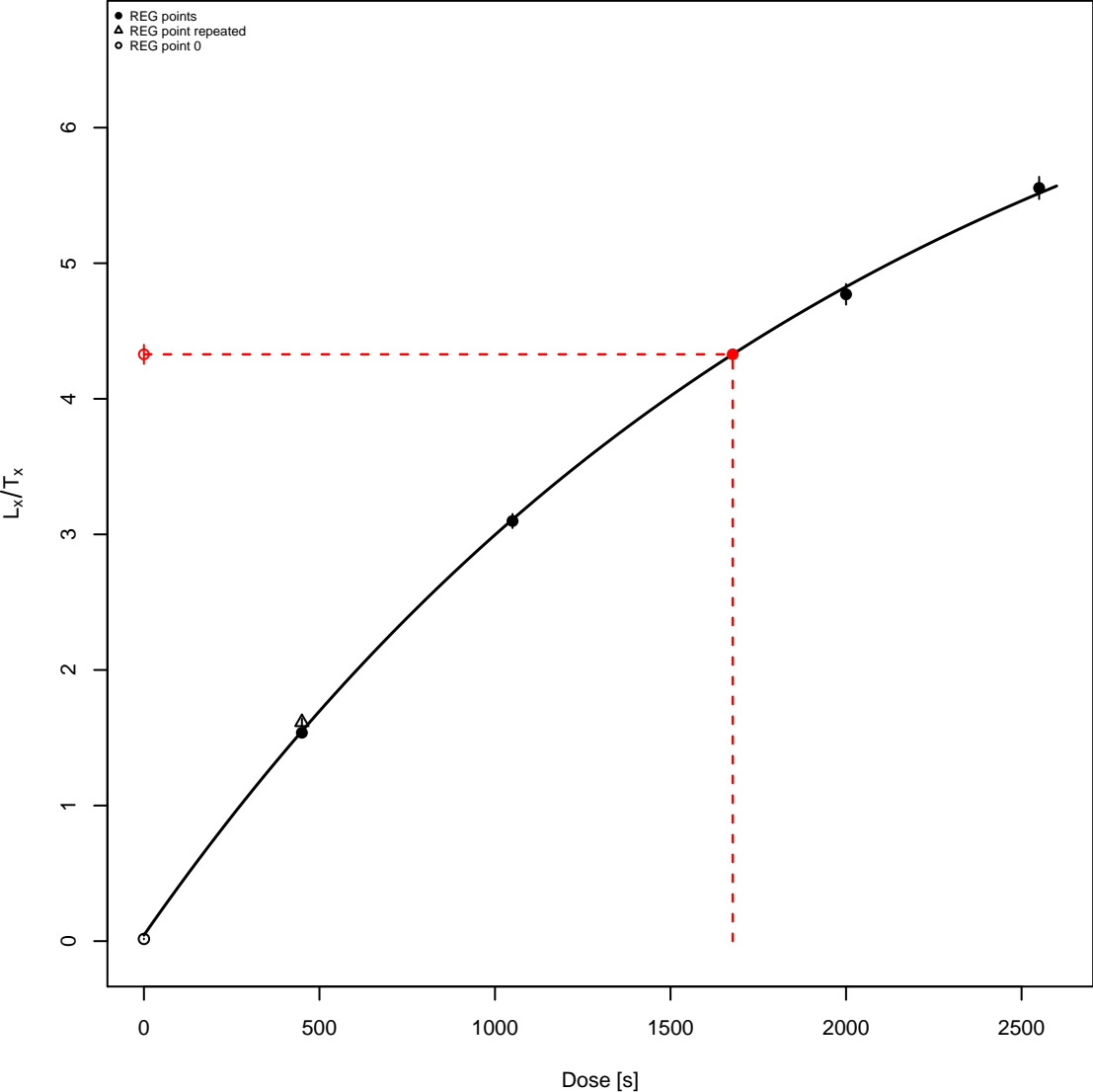
Pseudo pIRIR data set based on quartz OSL





Pseudo pIRIR data set based on quartz OSL

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



help("analyse_pIRIRSequence")

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



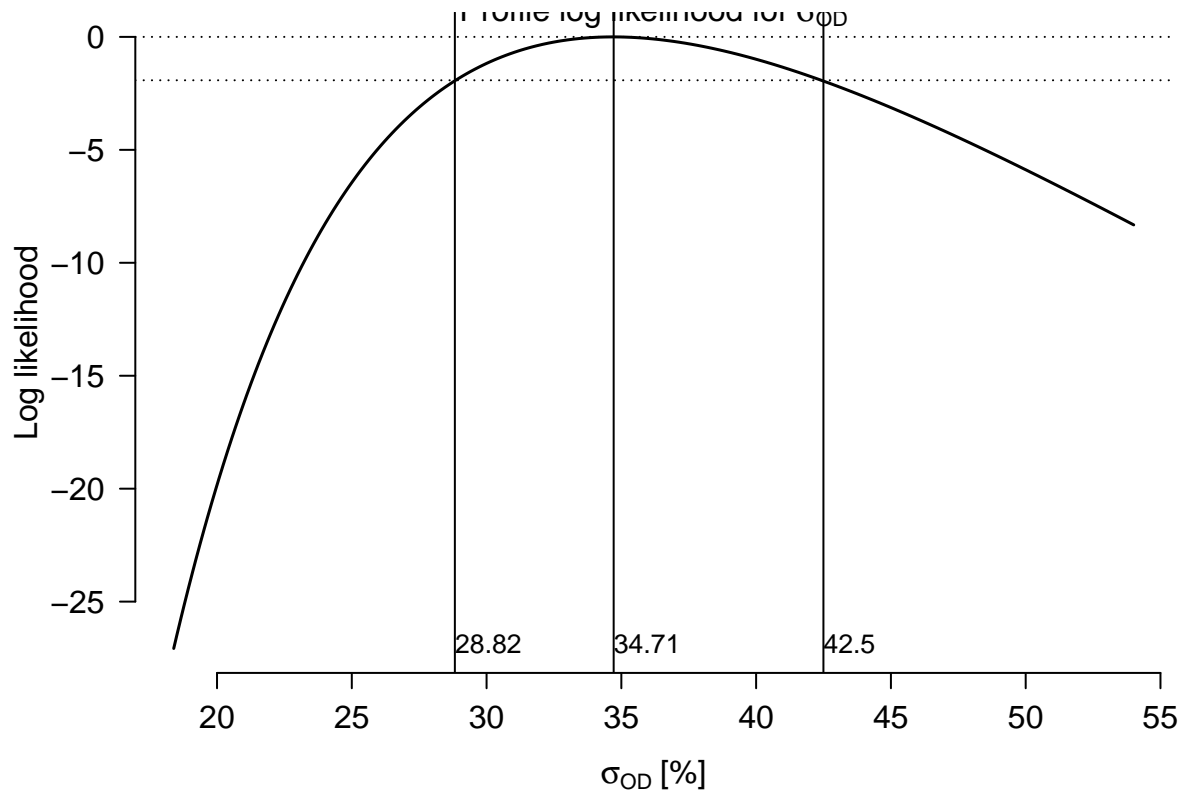
Rejection criteria



Monte Carlo Simulation

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

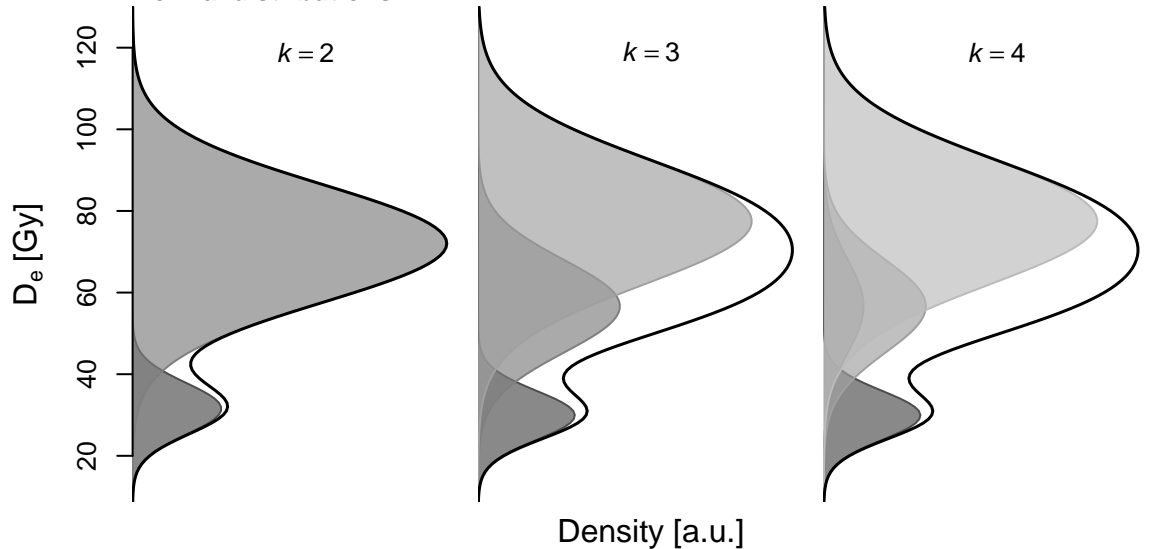




Finite Mixture Model

$\sigma_b = 0.2 \mid n = 62$

Normal distributions



Proportion of components



Statistical criteria



help("calc_FiniteMixture")

used values = 22









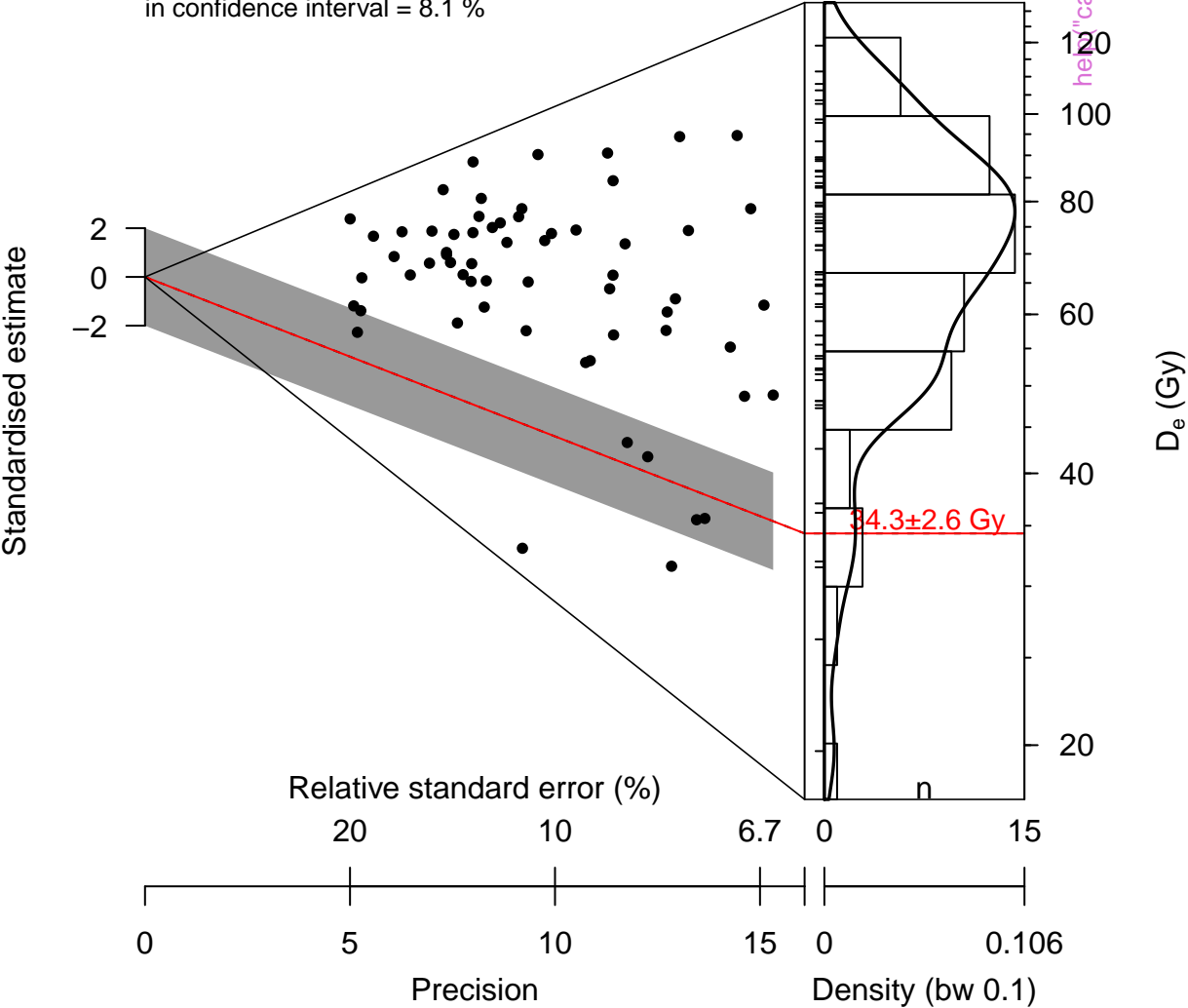




3-parameter Minimum Age Model

Parameters: $\sigma_b = 0.1$, $\gamma = 3.5$, $\sigma = 0.7$, $\rho = 0.01$

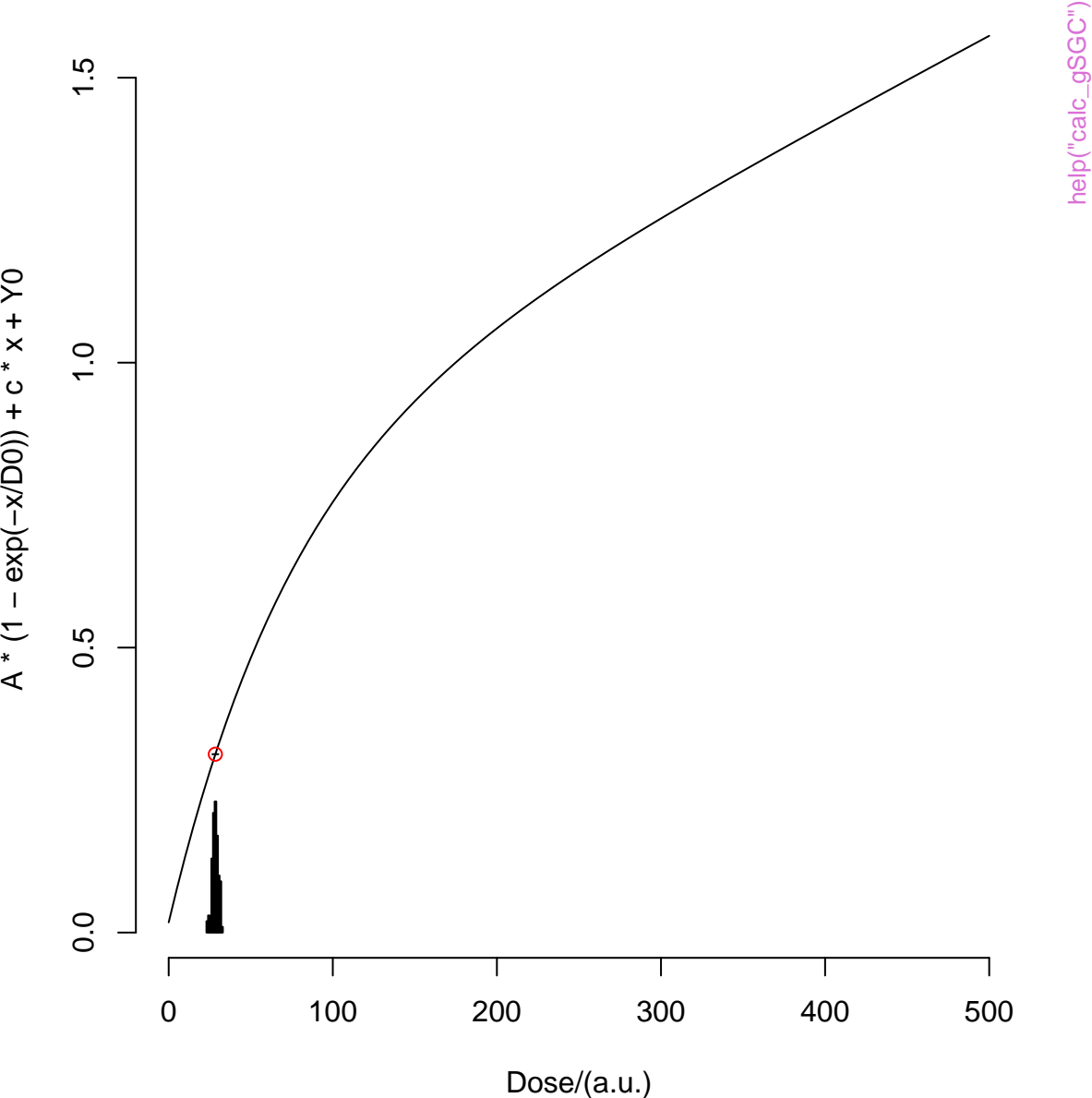
n = 62
mean = 69.93
weighted mean = 59.3
median = 71.07
in confidence interval = 8.1 %



D_e distribution

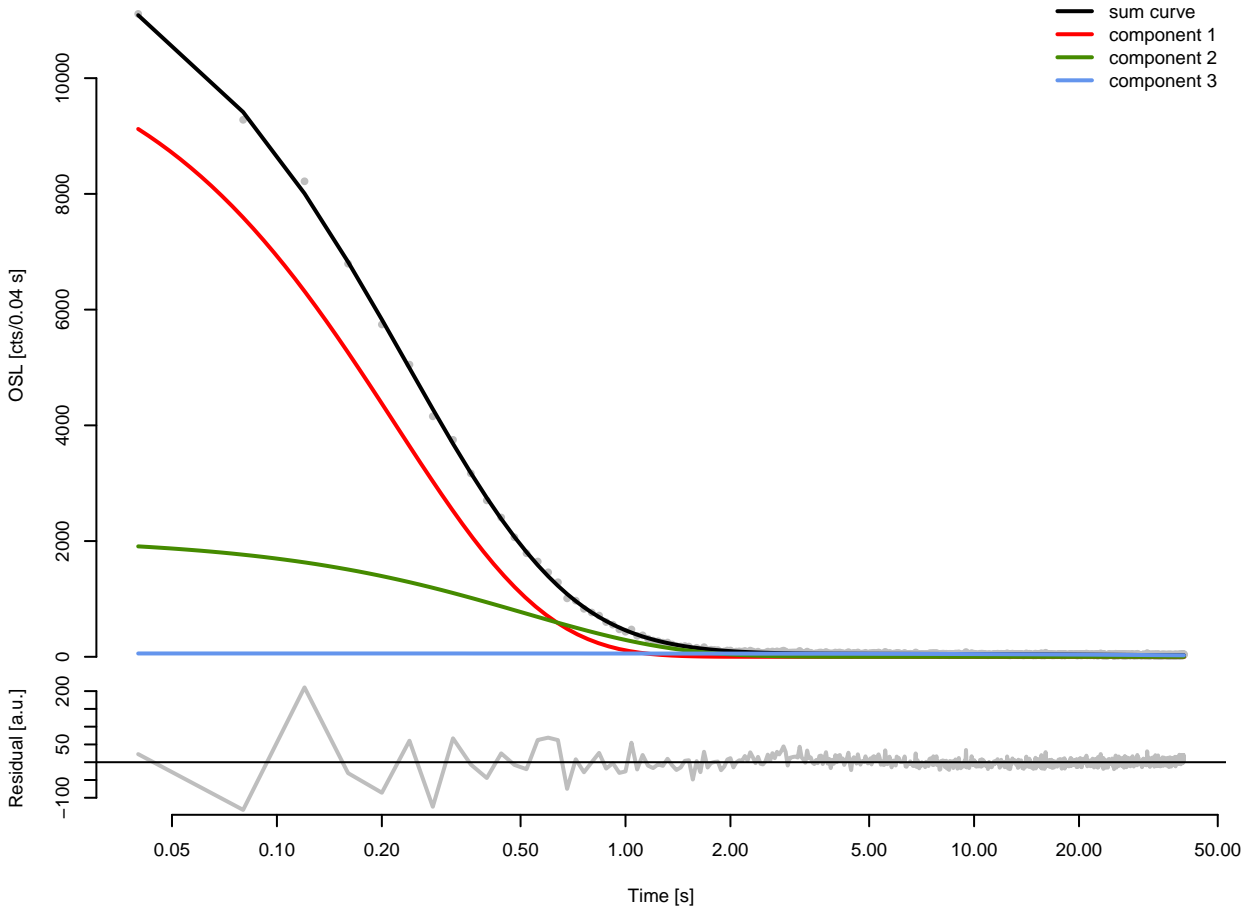


gSGC and resulting De

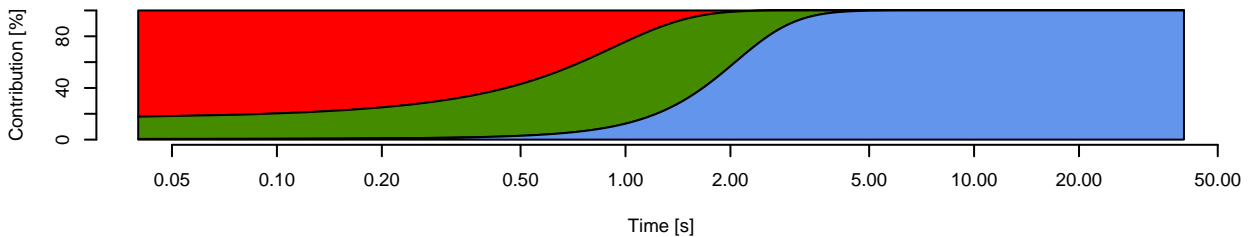


CW Curve Fit

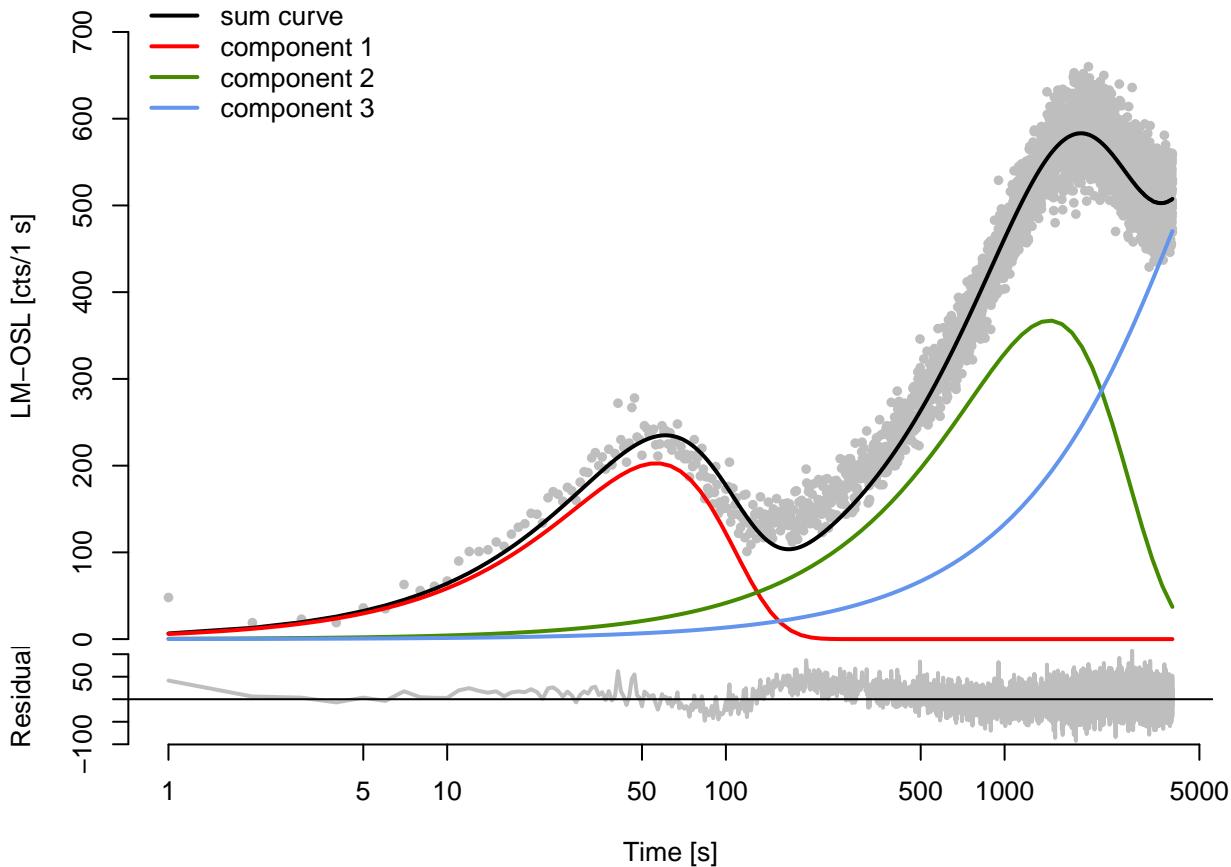
Default



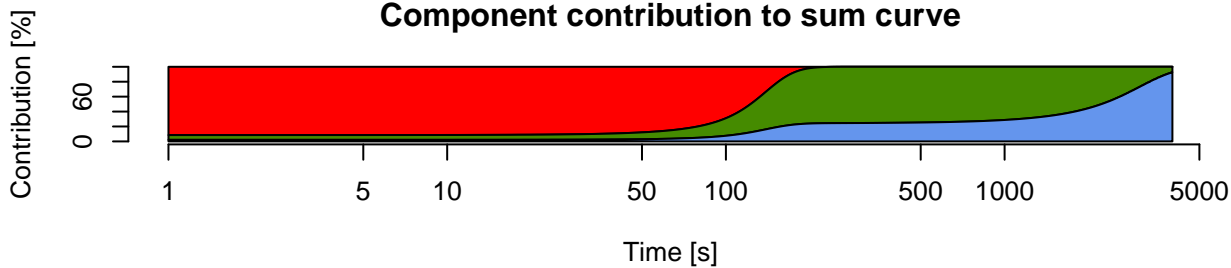
Component contribution to sum curve



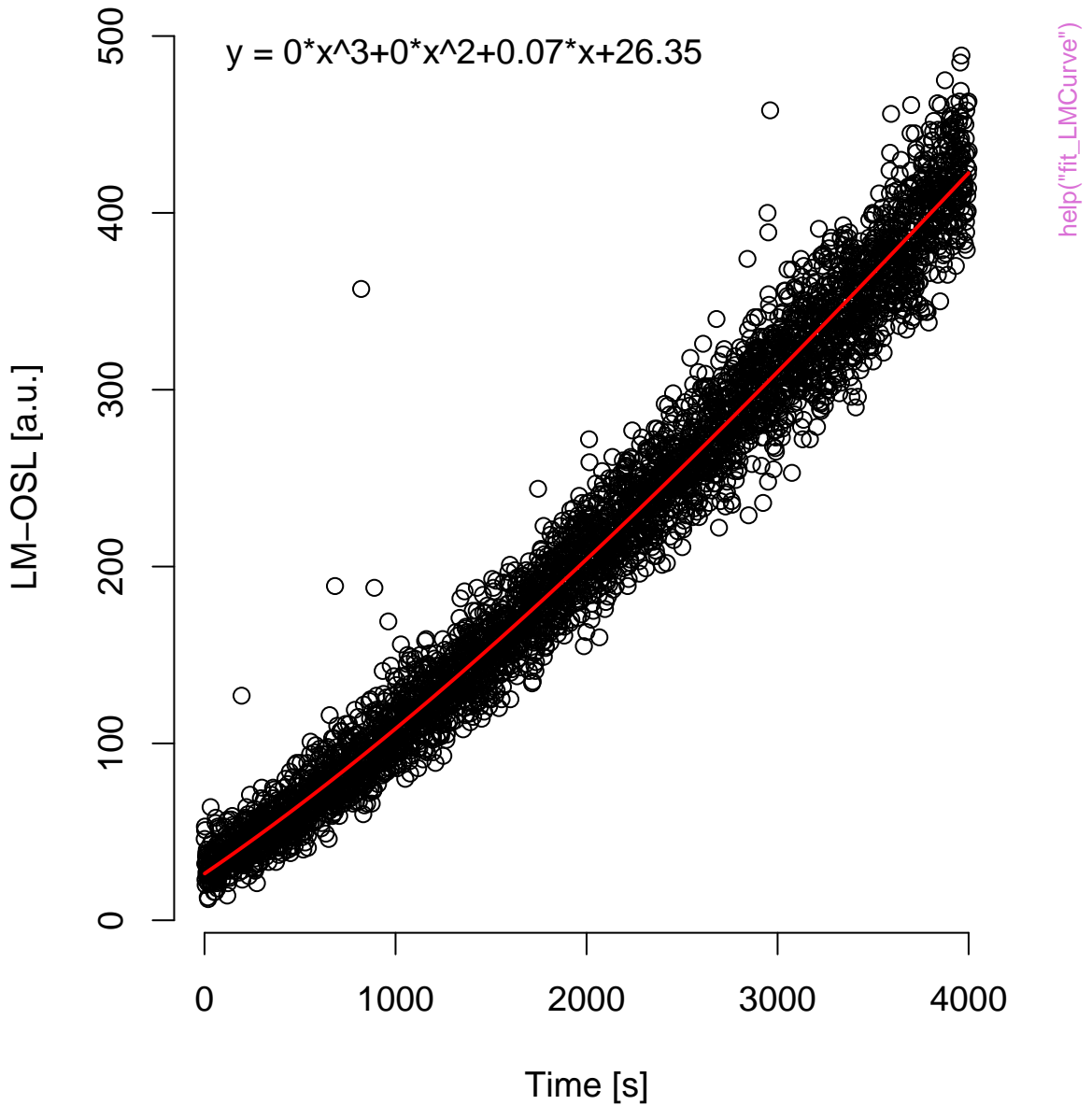
Default



Component contribution to sum curve



Background



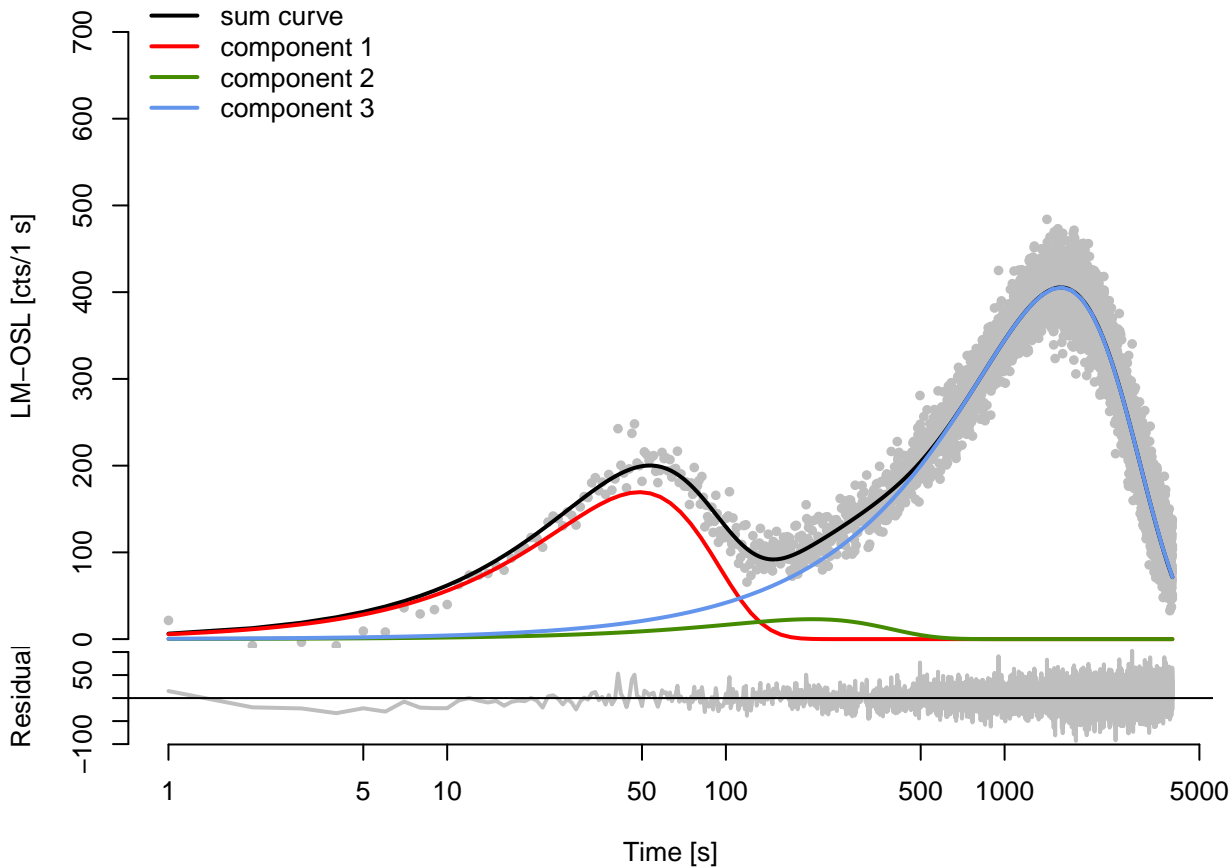
Default



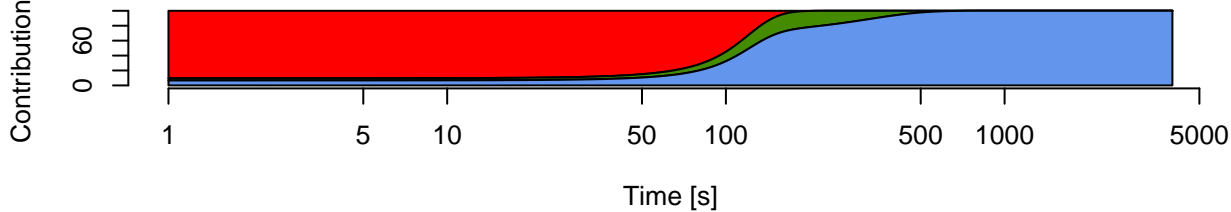
Component contribution to sum curve



Default



Component contribution to sum curve

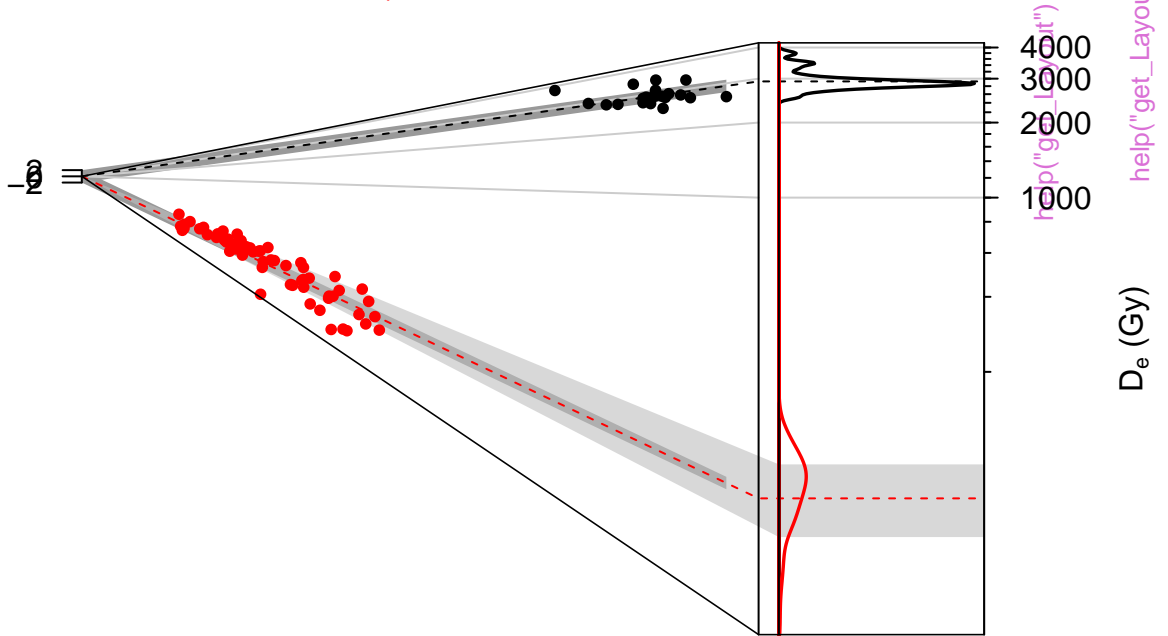


D_e distribution

n = 25 | in confidence interval = 68 %

n = 62 | in confidence interval = 41.9 %

Standardised estimate



Relative standard error (%)

10

5

3.3

0

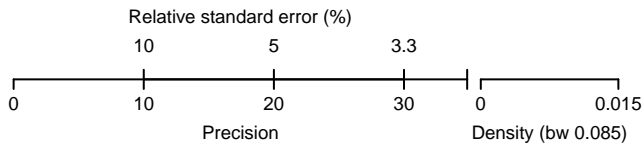
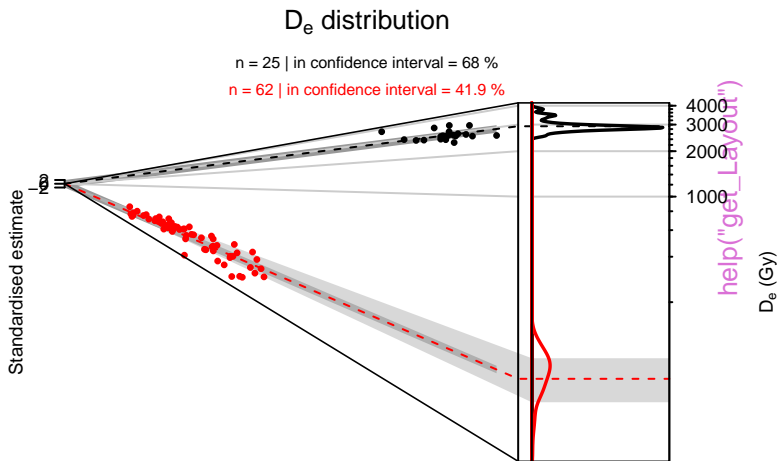
10

20

30

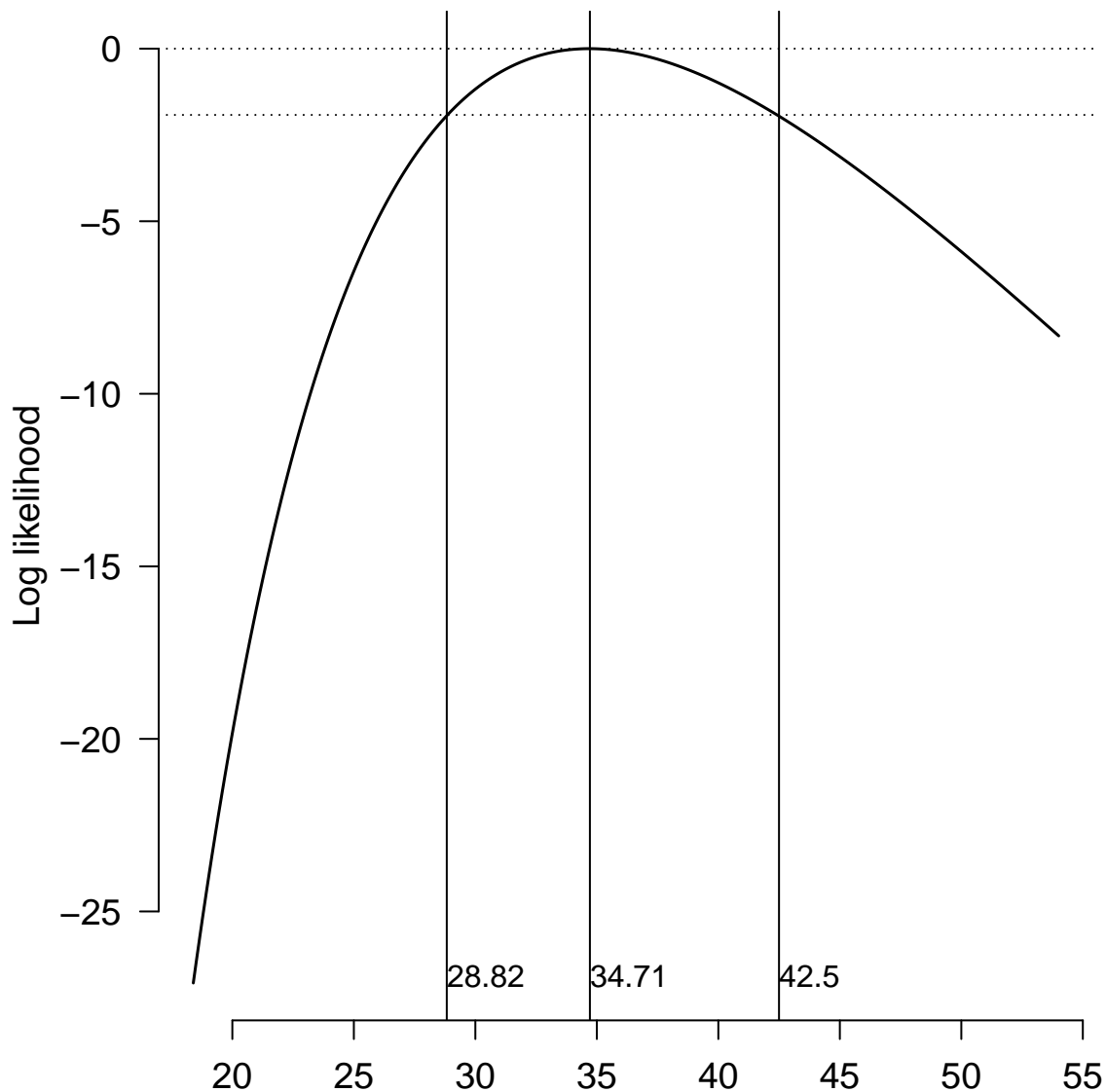
Density (bw 0.085)

0.015



help("get_Layout")

Profile log likelihood for σ_{OD}

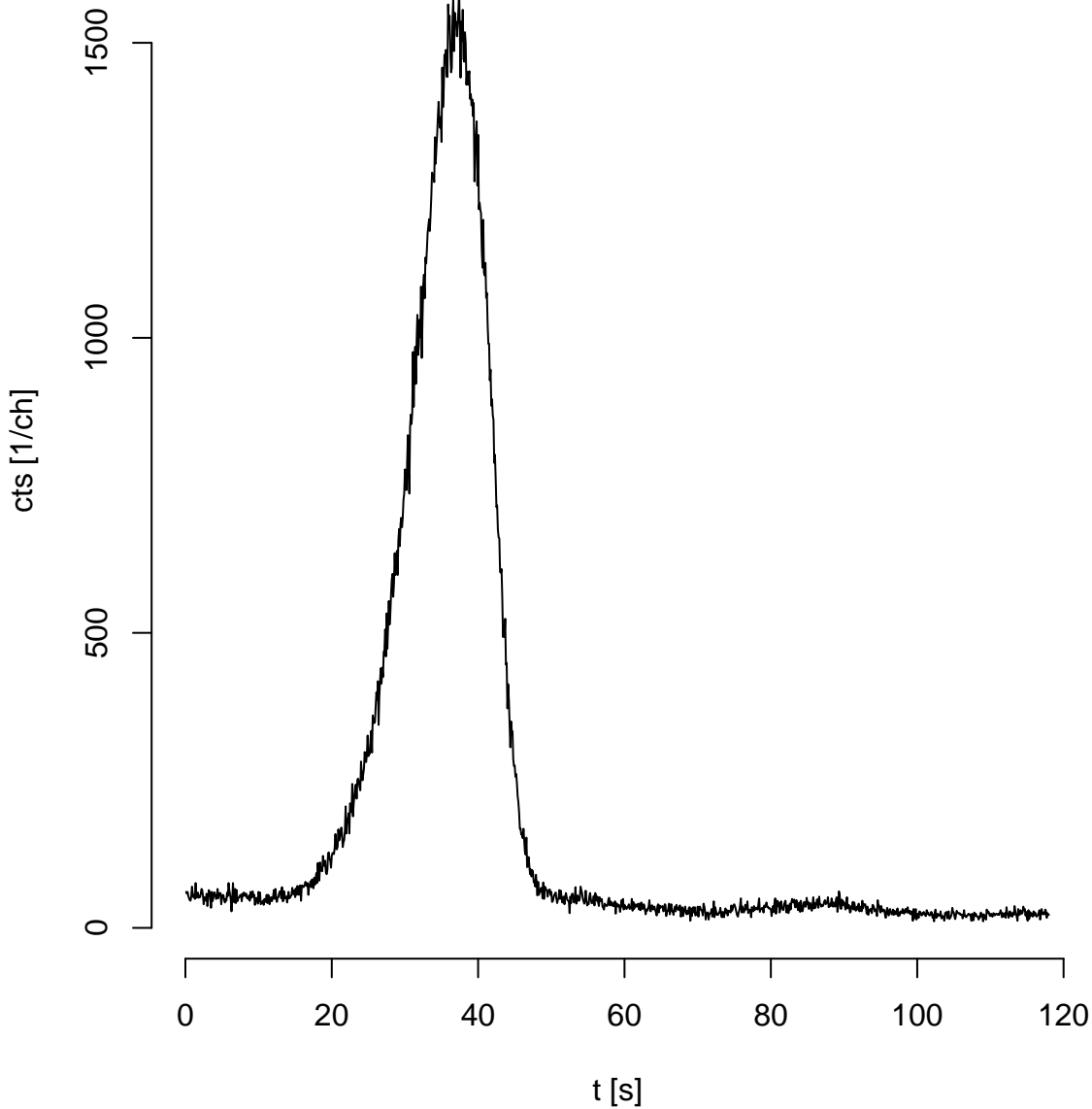


TL (UVVIS)



help("merge_RLum.Data.Curve")

TL (UVVIS)



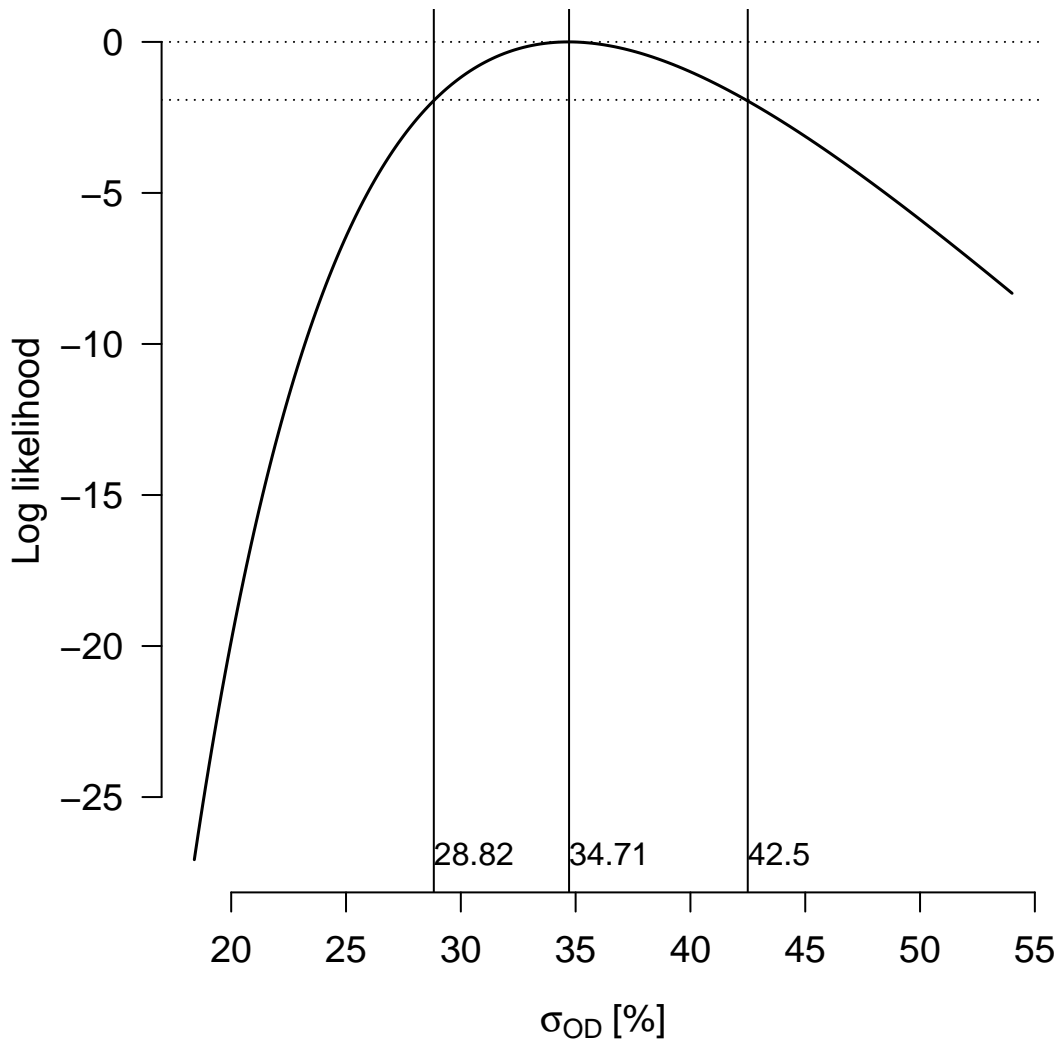
help("merge_RLum.Data.Curve")

TL (UVVIS)

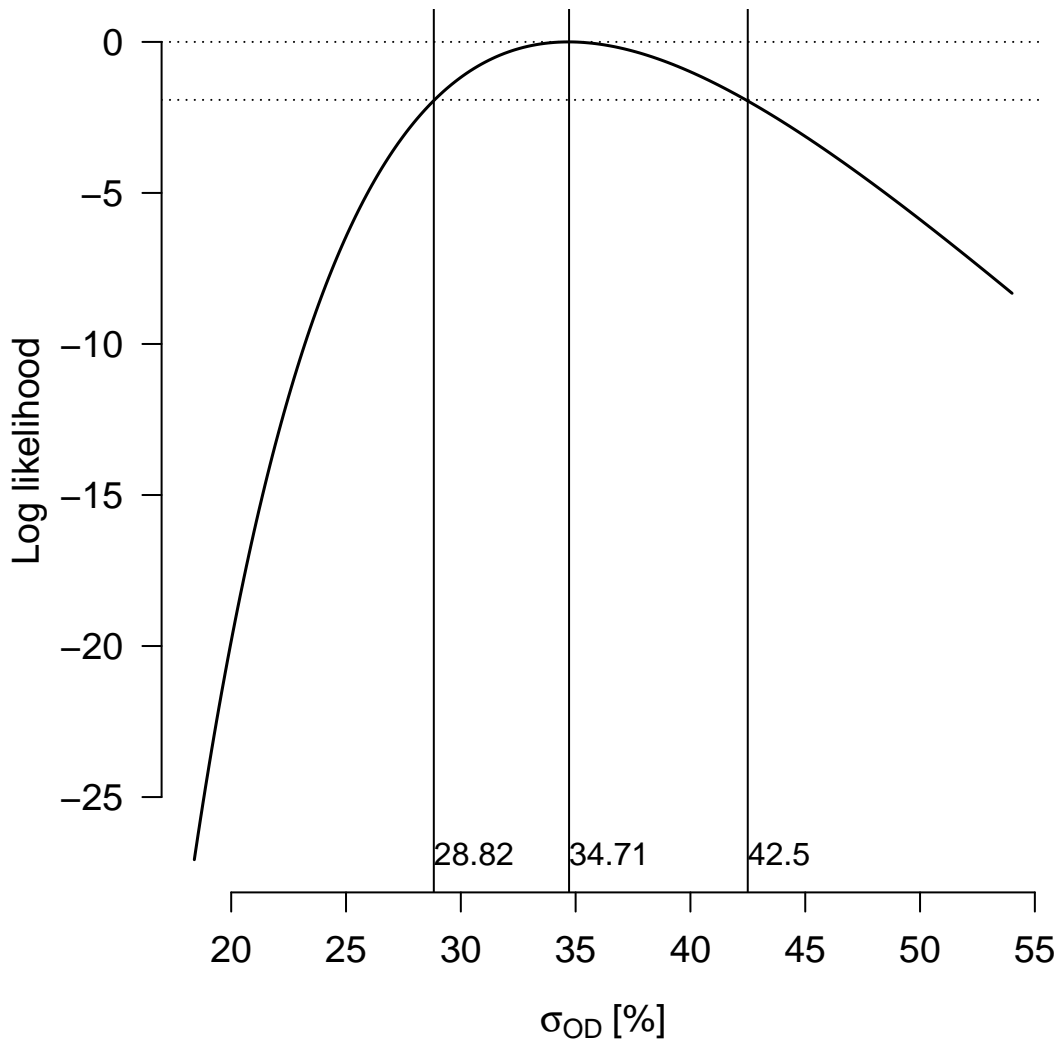


help("merge_RLum.Data.Curve")

Profile log likelihood for σ_{OD}



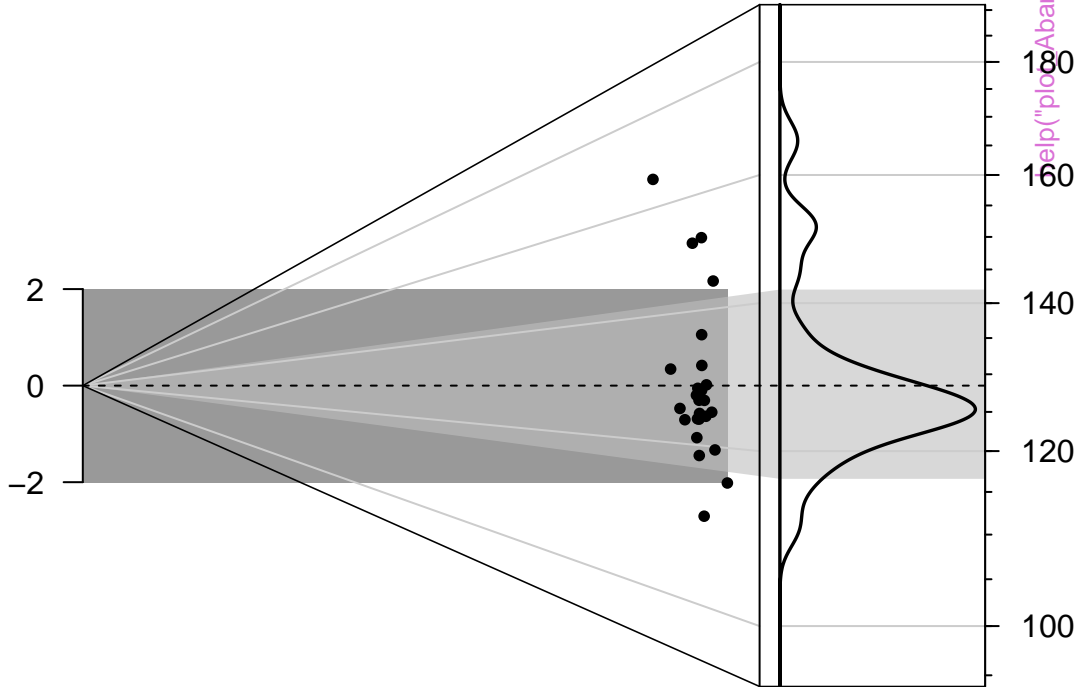
Profile log likelihood for σ_{OD}



D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



D_e (Gy)

Relative standard error (%)

20 10 6.7

0

5

10

15

0

0.068

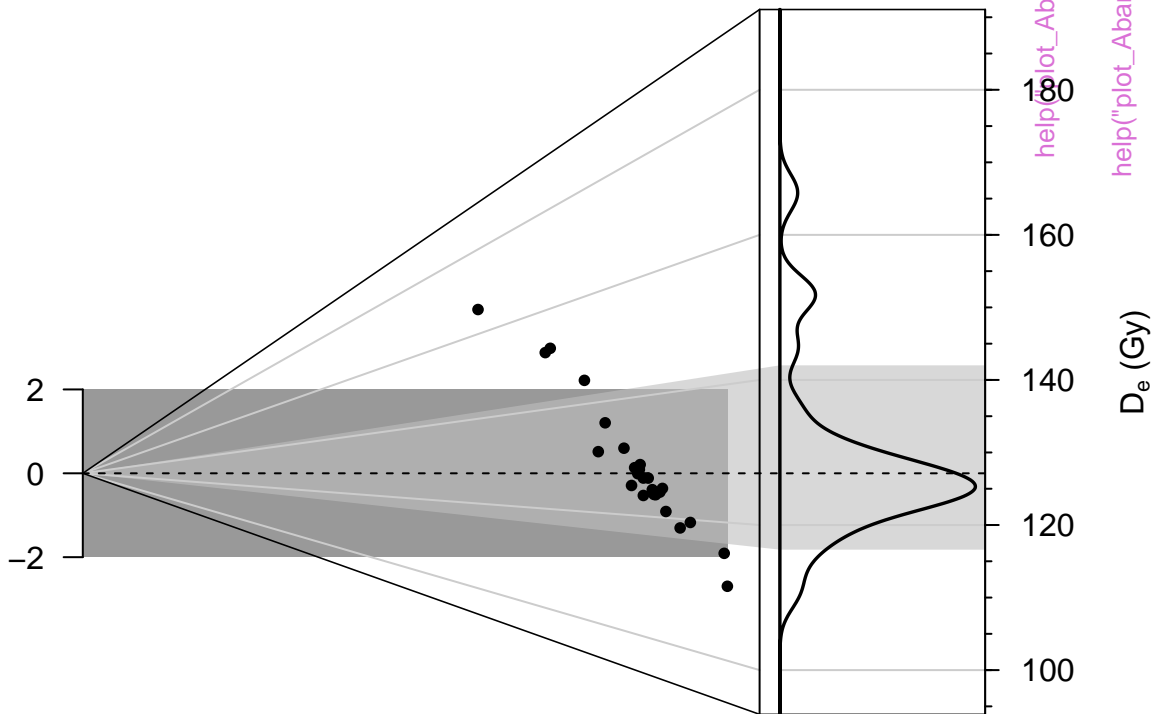
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 80 %

Standardised estimate



Standard error (Gy)

20

10

6.7

0.00

0.05

0.10

0.15

0.068

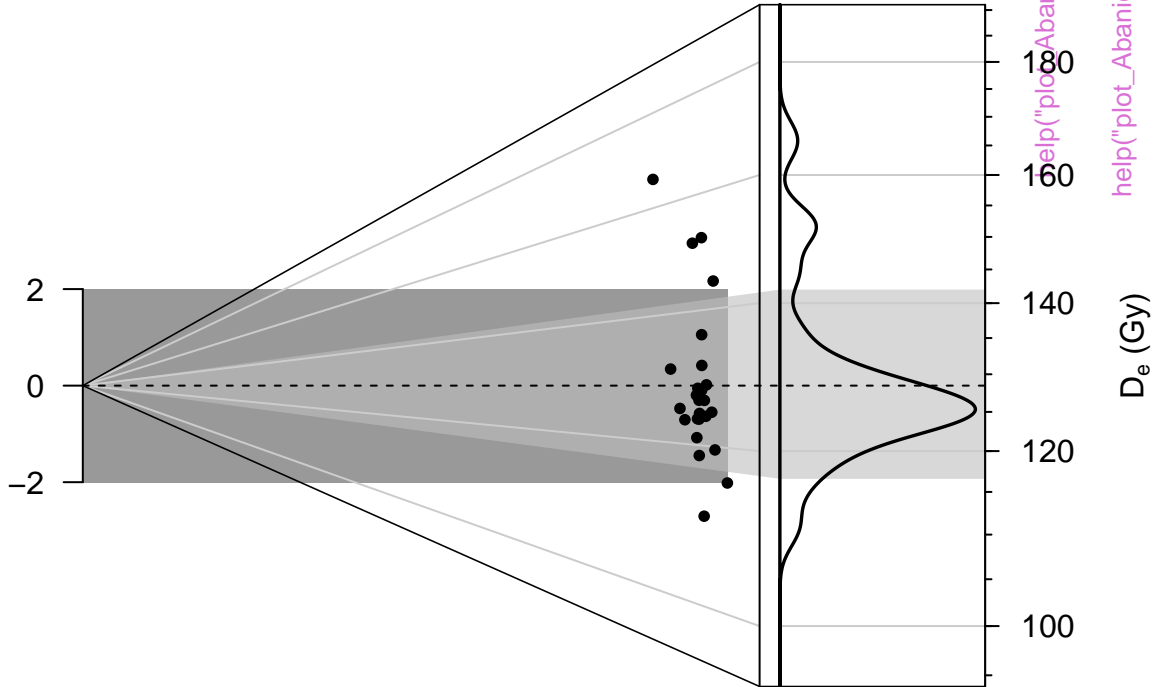
Precision

Density (bw 2.572)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



Relative standard error (%)

20 10 6.7

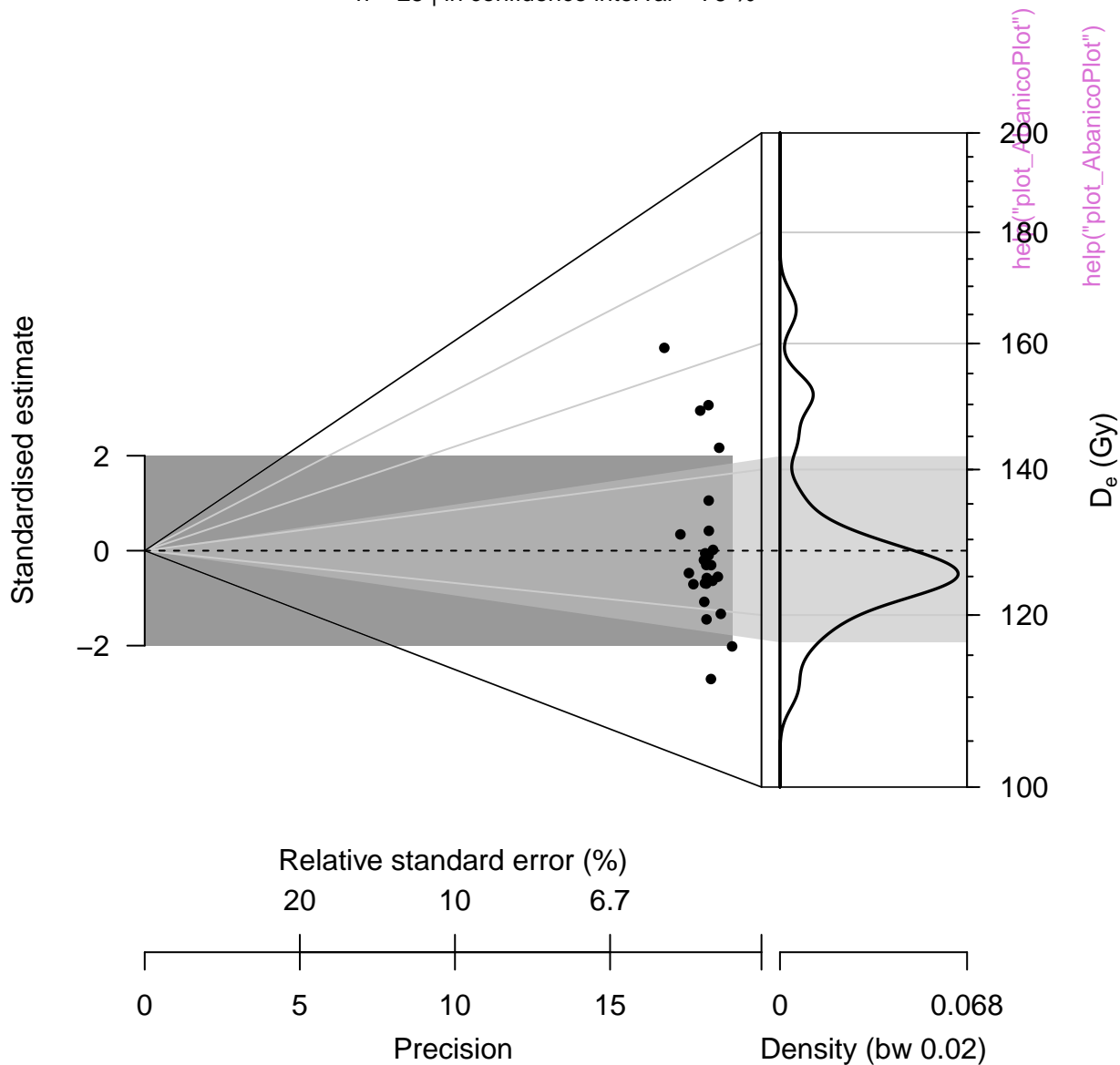
0 5 10 15 0 0.068

Precision

Density (bw 0.02)

D_e distribution

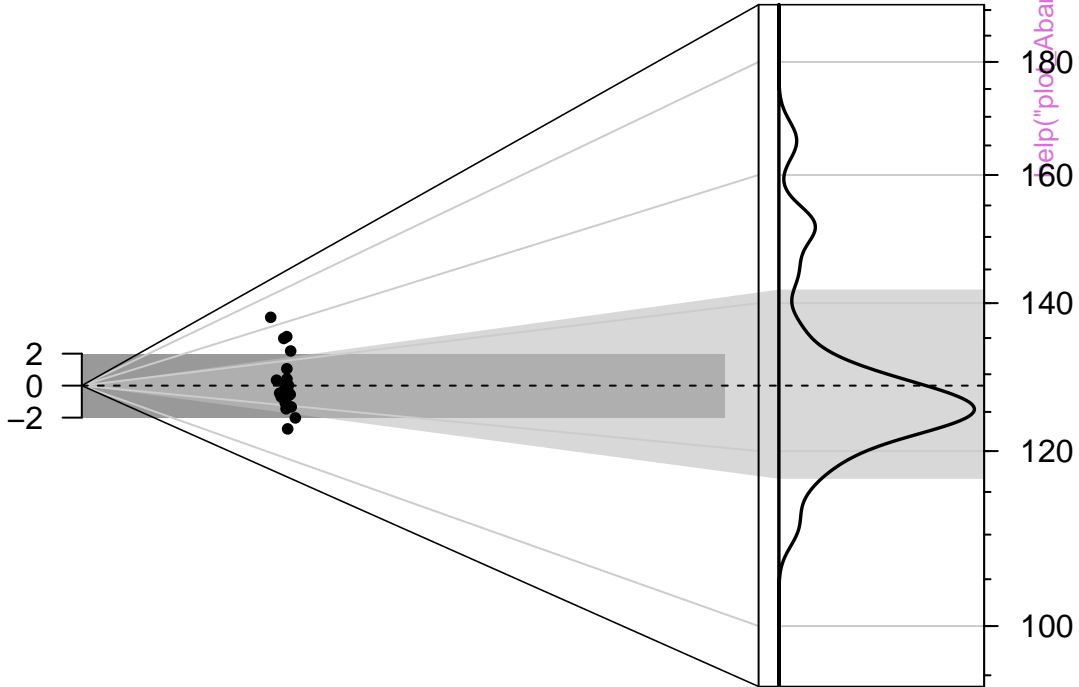
n = 25 | in confidence interval = 76 %



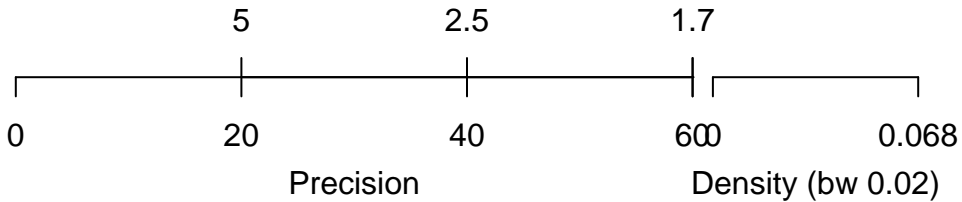
D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



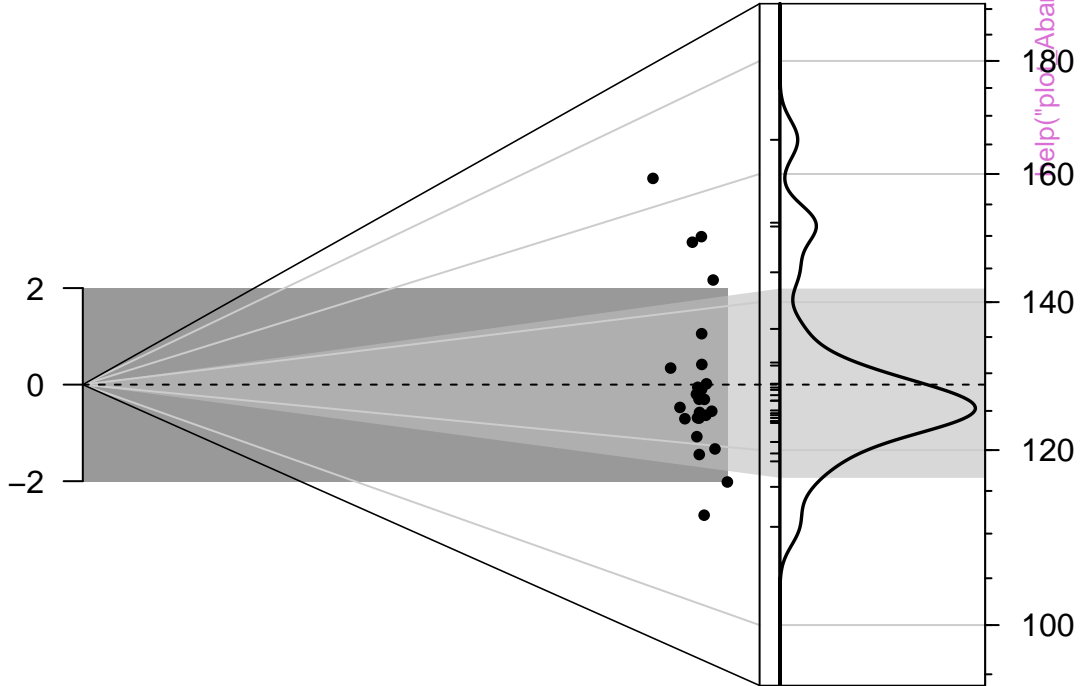
Relative standard error (%)



D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate

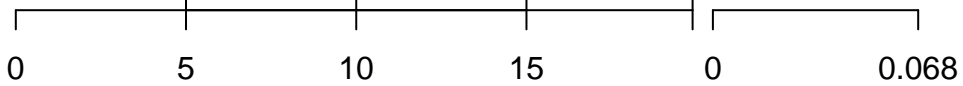


help("plot_AbanicoPlot")

D_e (Gy)

Relative standard error (%)

20 10 6.7



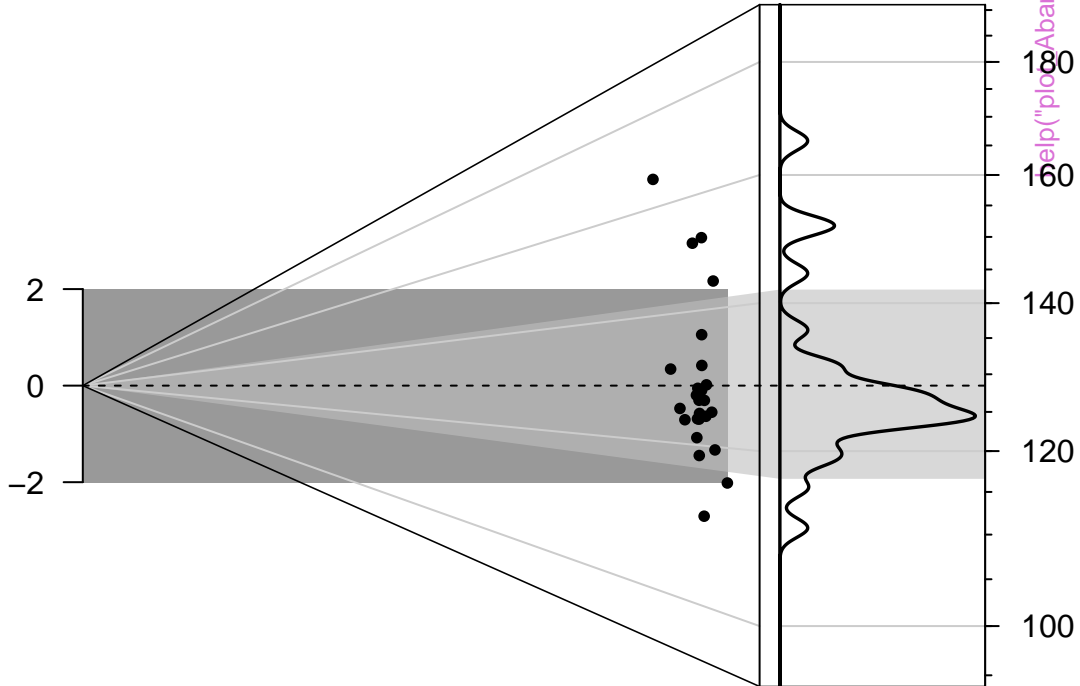
Precision

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

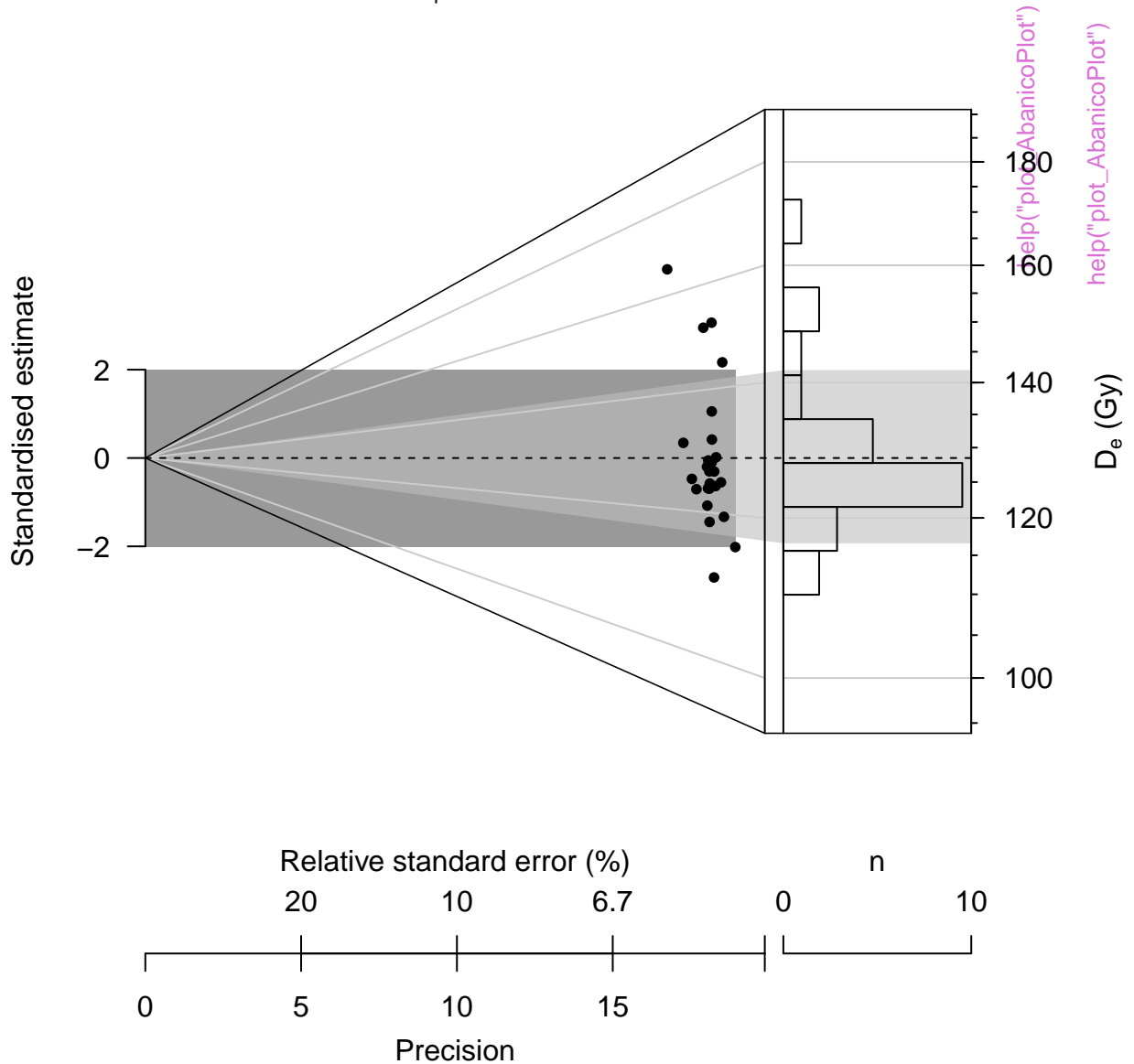
2.015

Precision

Density (bw 0.01)

D_e distribution

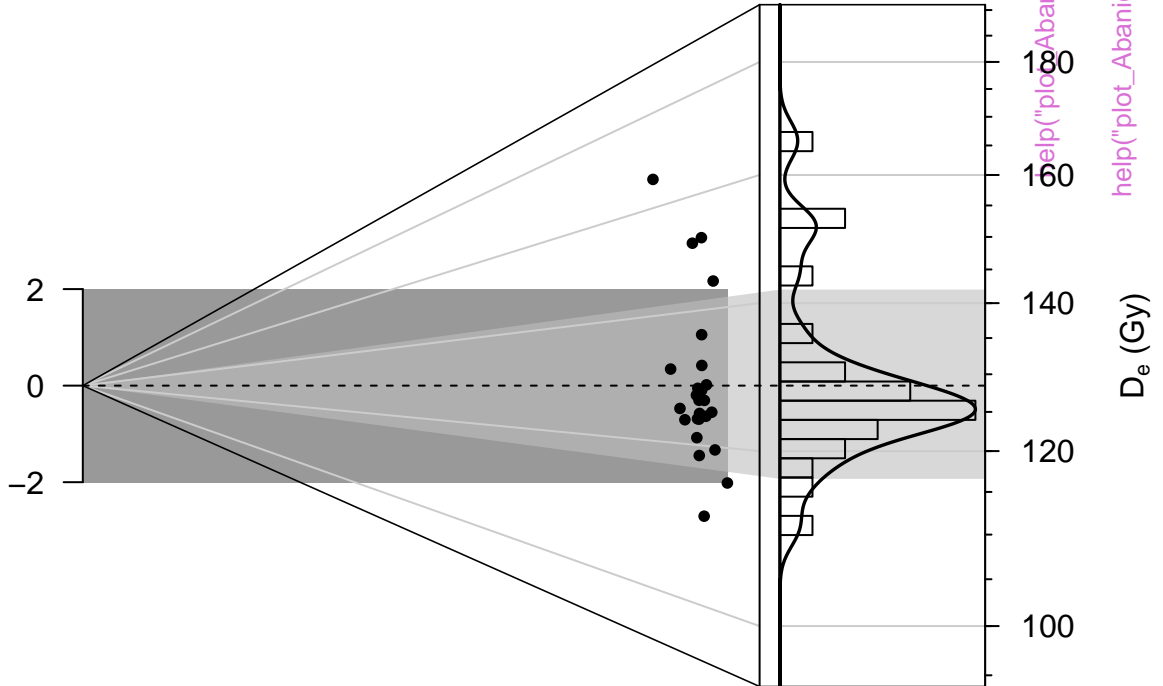
n = 25 | in confidence interval = 76 %



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

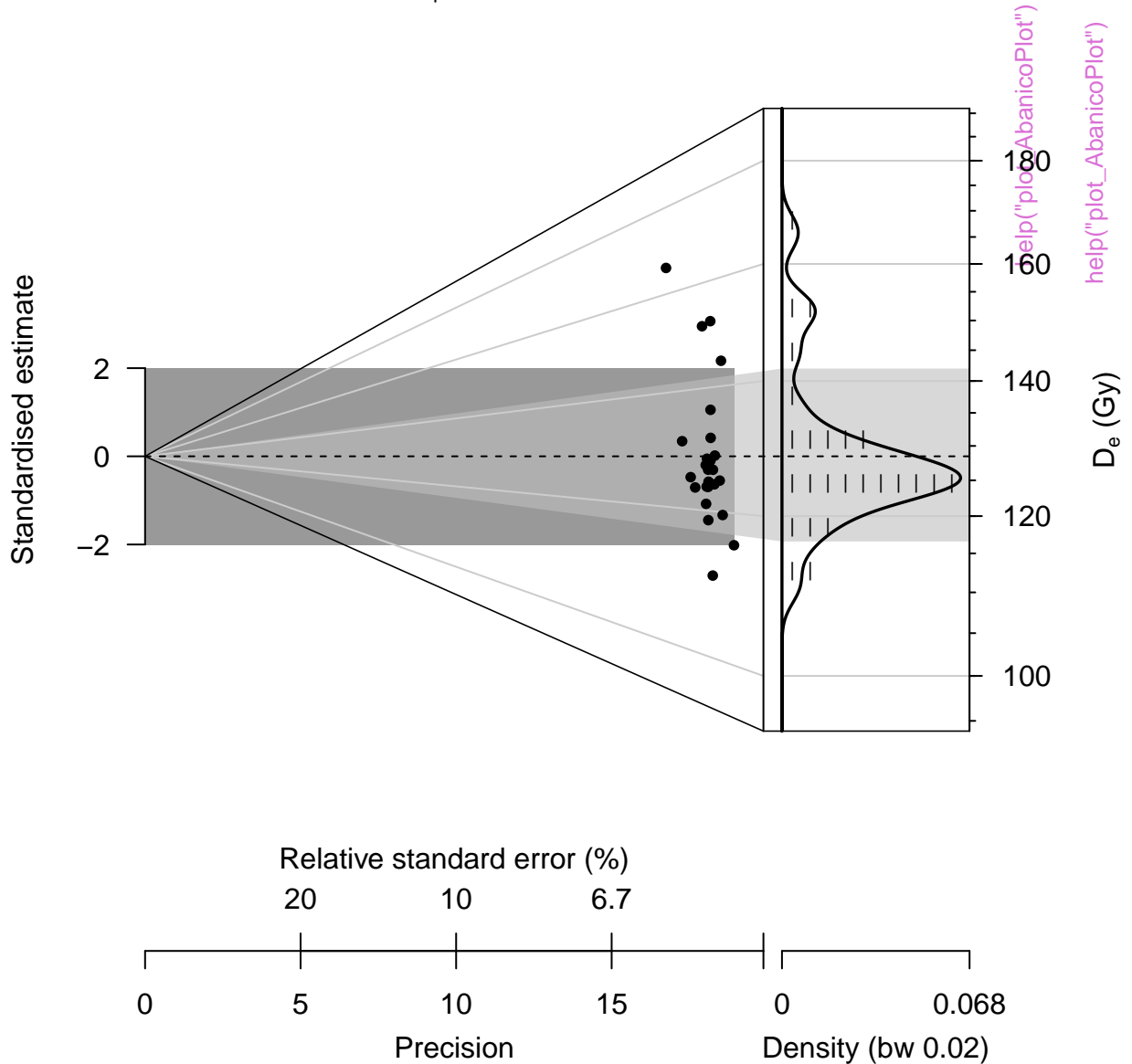
0.068

Precision

Density (bw 0.02)

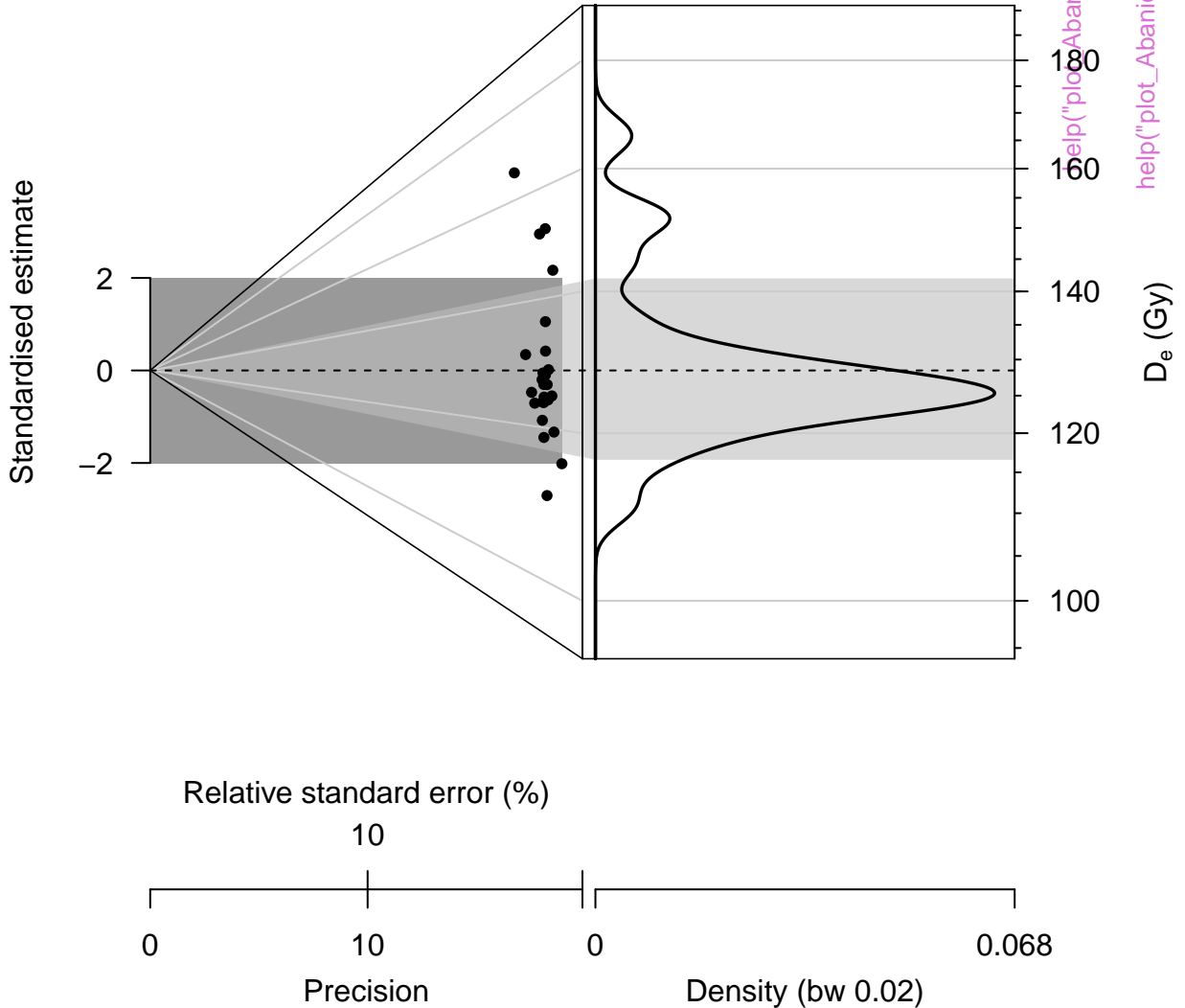
D_e distribution

n = 25 | in confidence interval = 76 %



D_e distribution

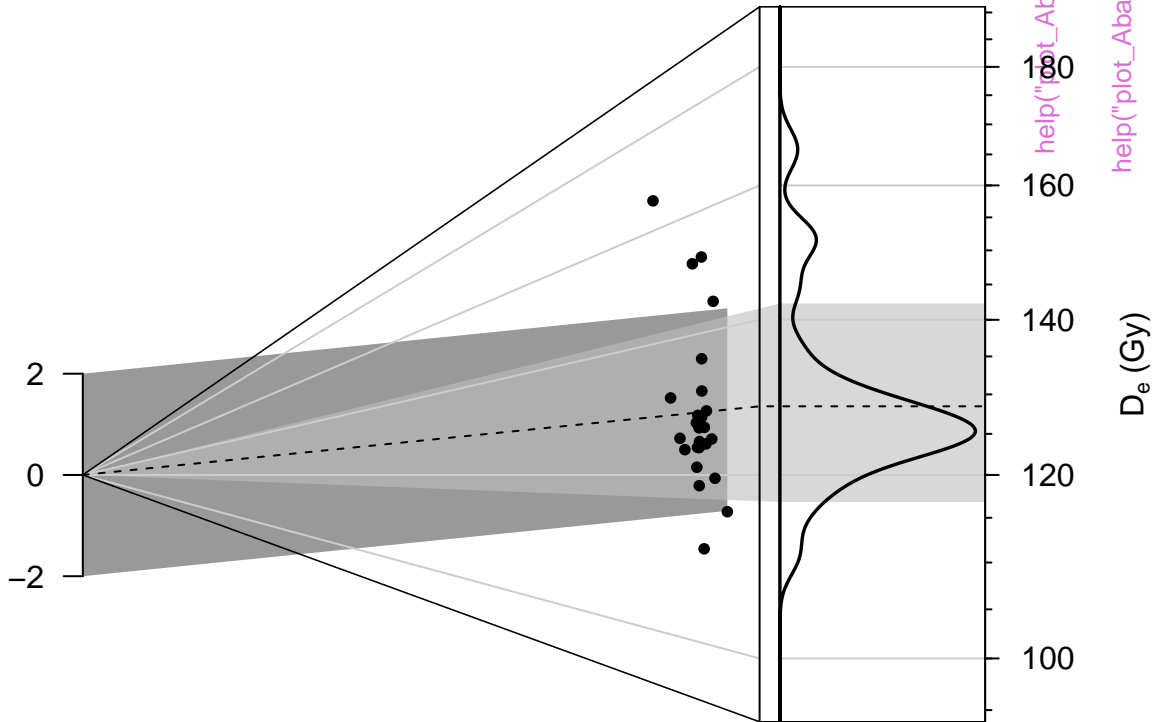
n = 25 | in confidence interval = 76 %



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

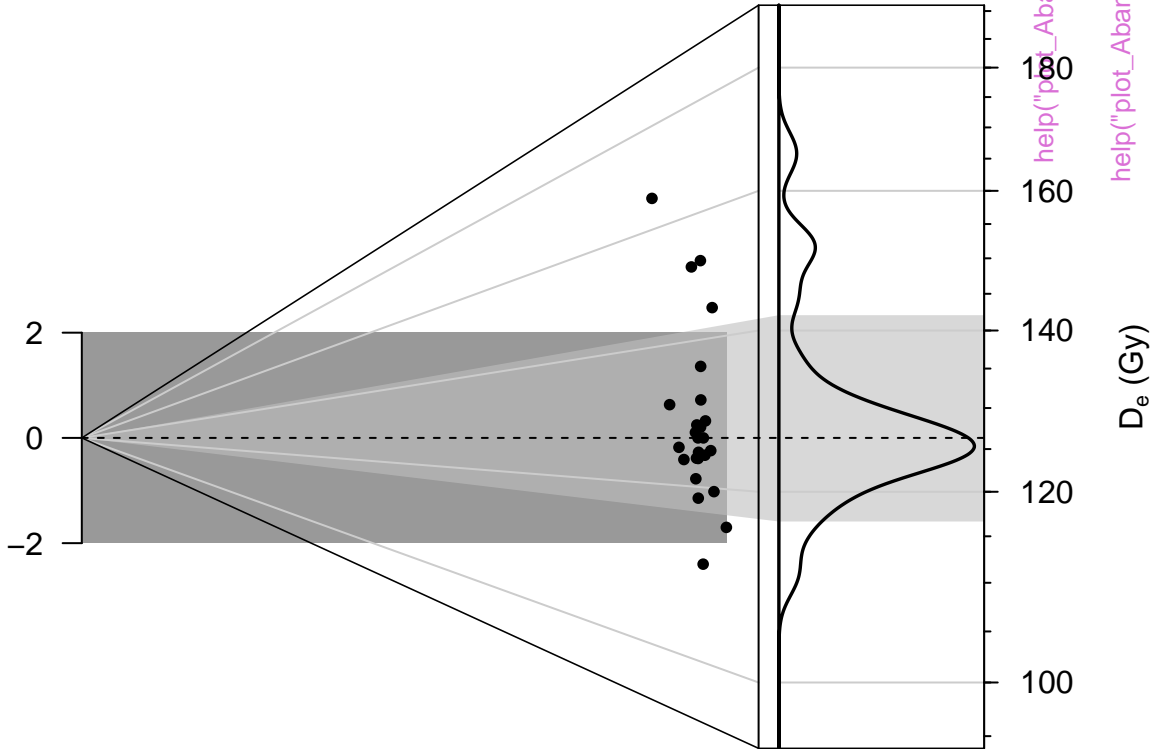
Precision

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 (Gy)

180

160

140

120

100

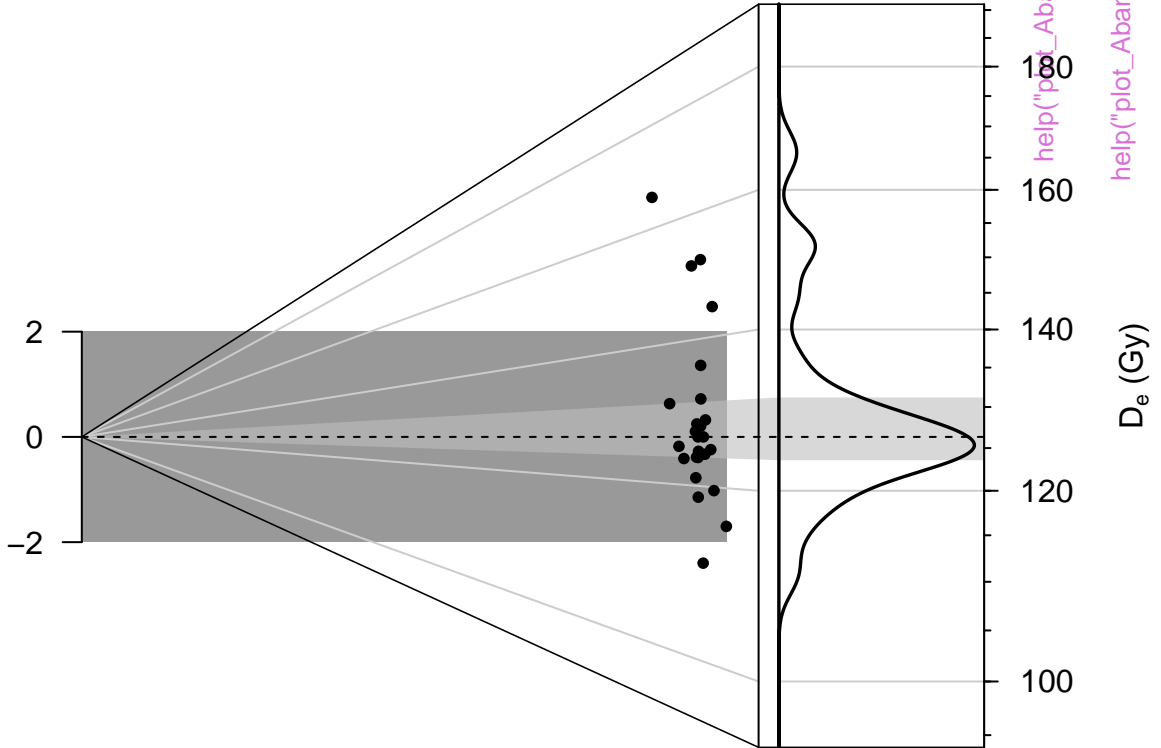
help("plot_AbanicoPlot")

help("plot_AbanicoPlot")

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

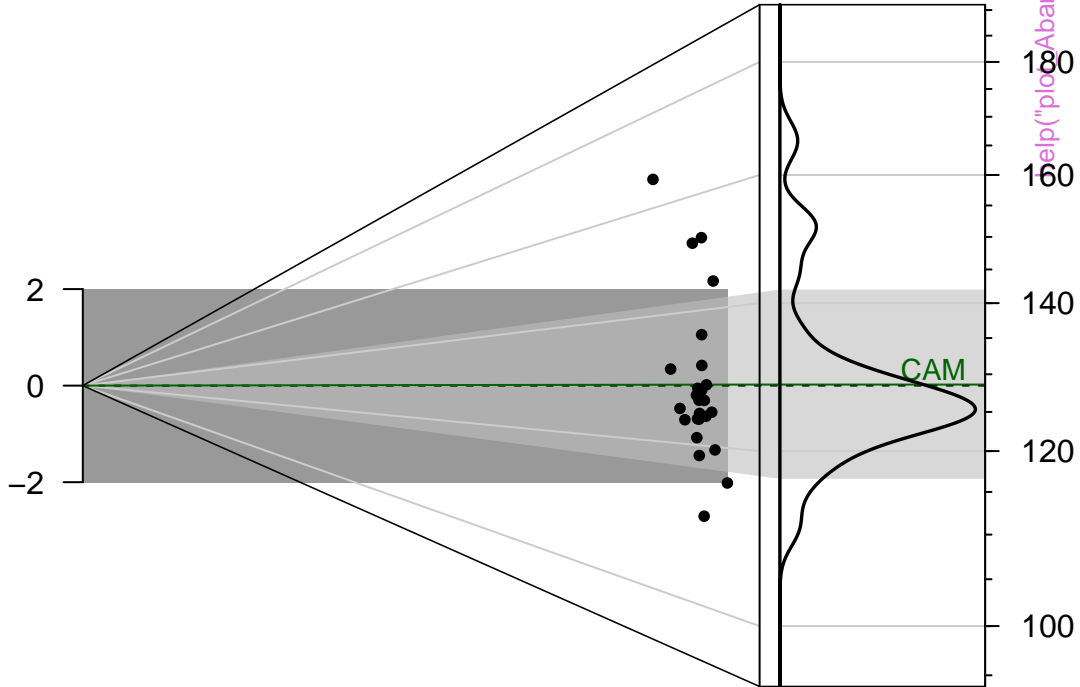
Precision

Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



help("plot_AbanicoPlot")

D_e (Gy)

Relative standard error (%)

20

10

6.7

0

5

10

15

0

0.068

Precision

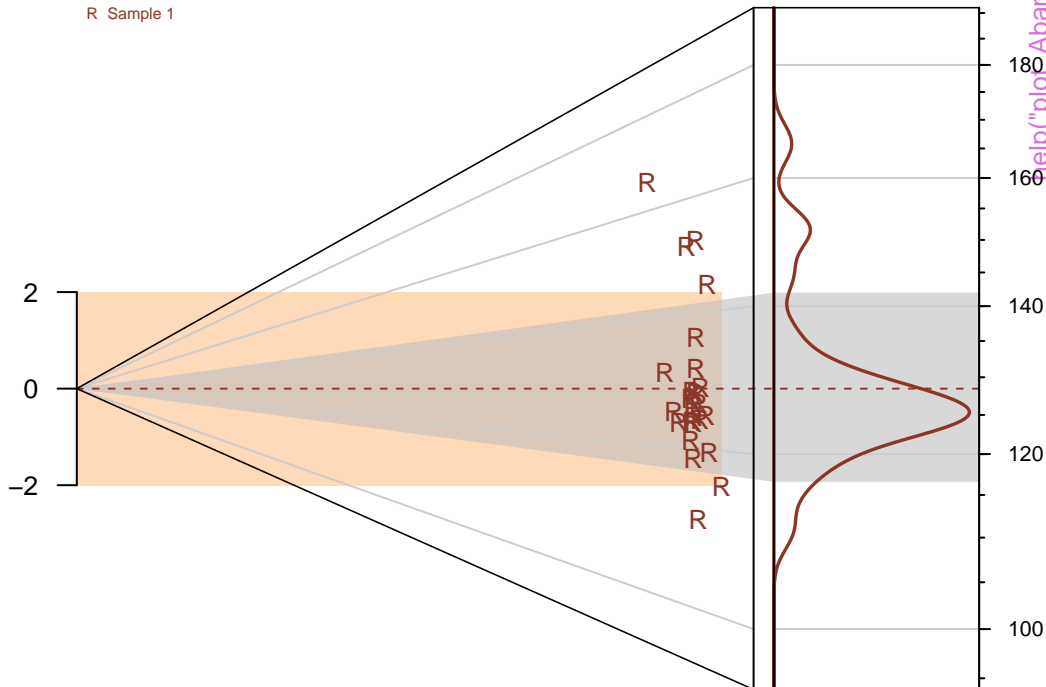
Density (bw 0.02)

D_e distribution

n = 25 | in confidence interval = 76 %

R Sample 1

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 = 25 | in confidence interval = 76 %

Standardised estimate

0

180

160

140

120

100

D_e (Gy)

Relative standard error (%)

20

10

6.7

0

5

10

15

0

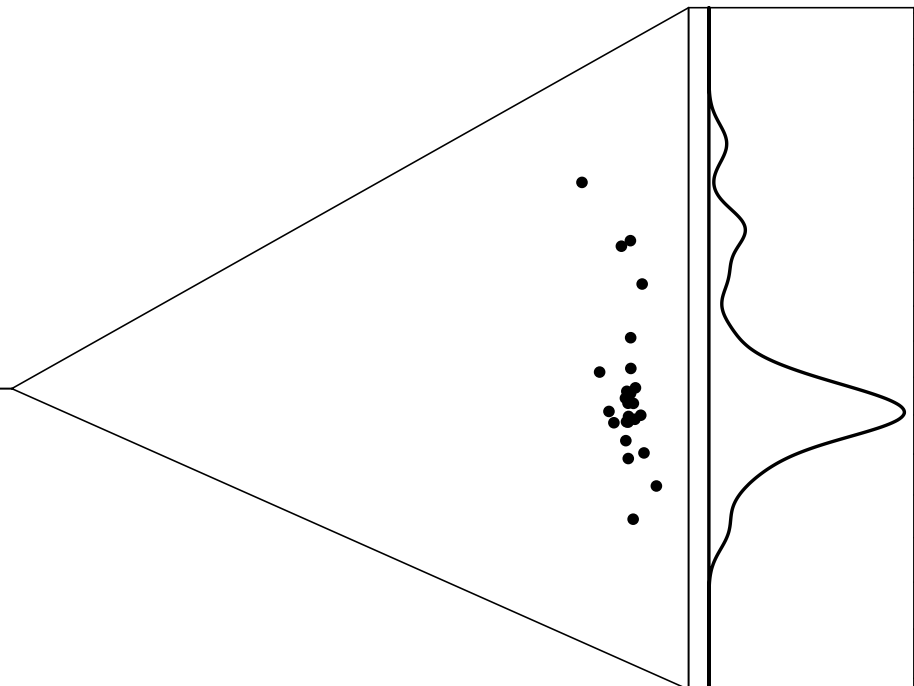
0.068

Precision

Density (bw 0.02)

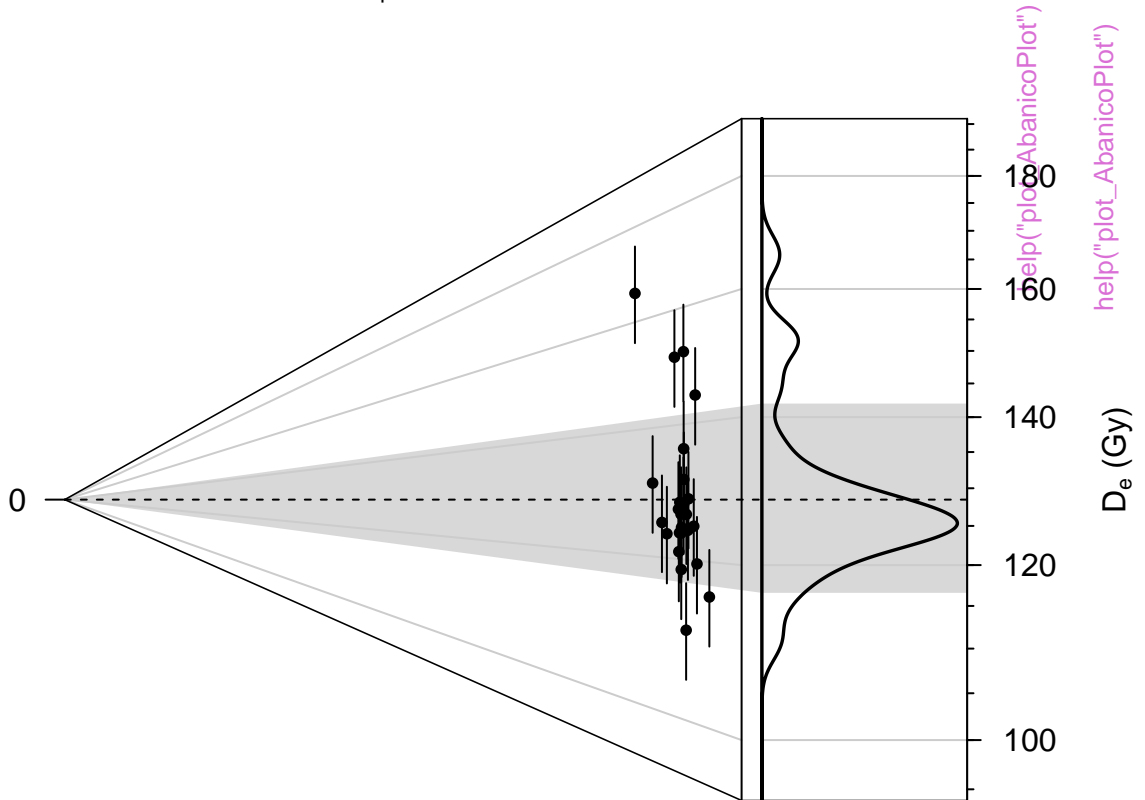
help("plot_AbanicoPlot")

help("plot_AbanicoPlot")



D_e distribution

n = 25 | in confidence interval = 76 %



Relative standard error (%)

20

10

6.7

0

5

10

15

0

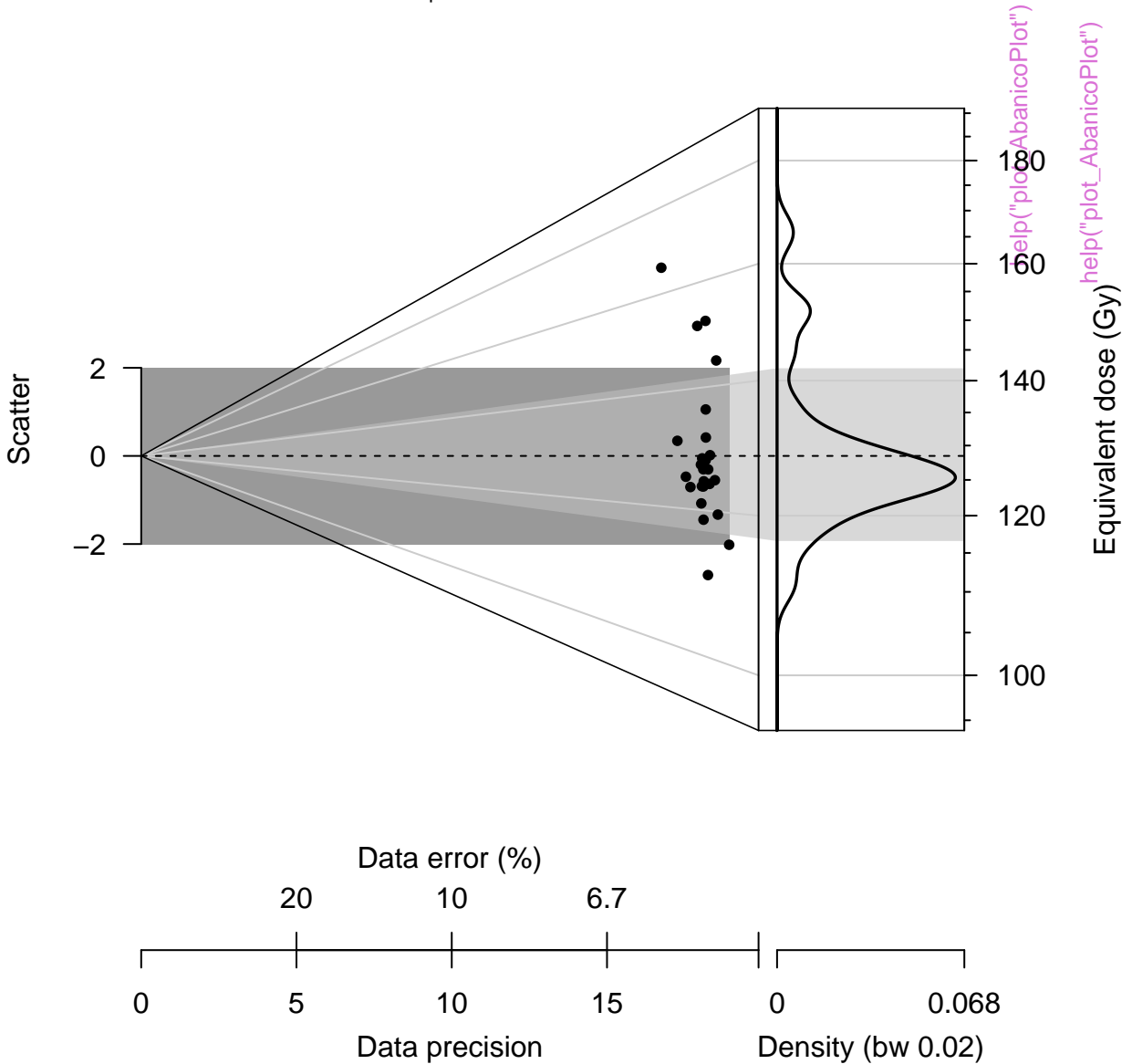
0.068

Precision

Density (bw 0.02)

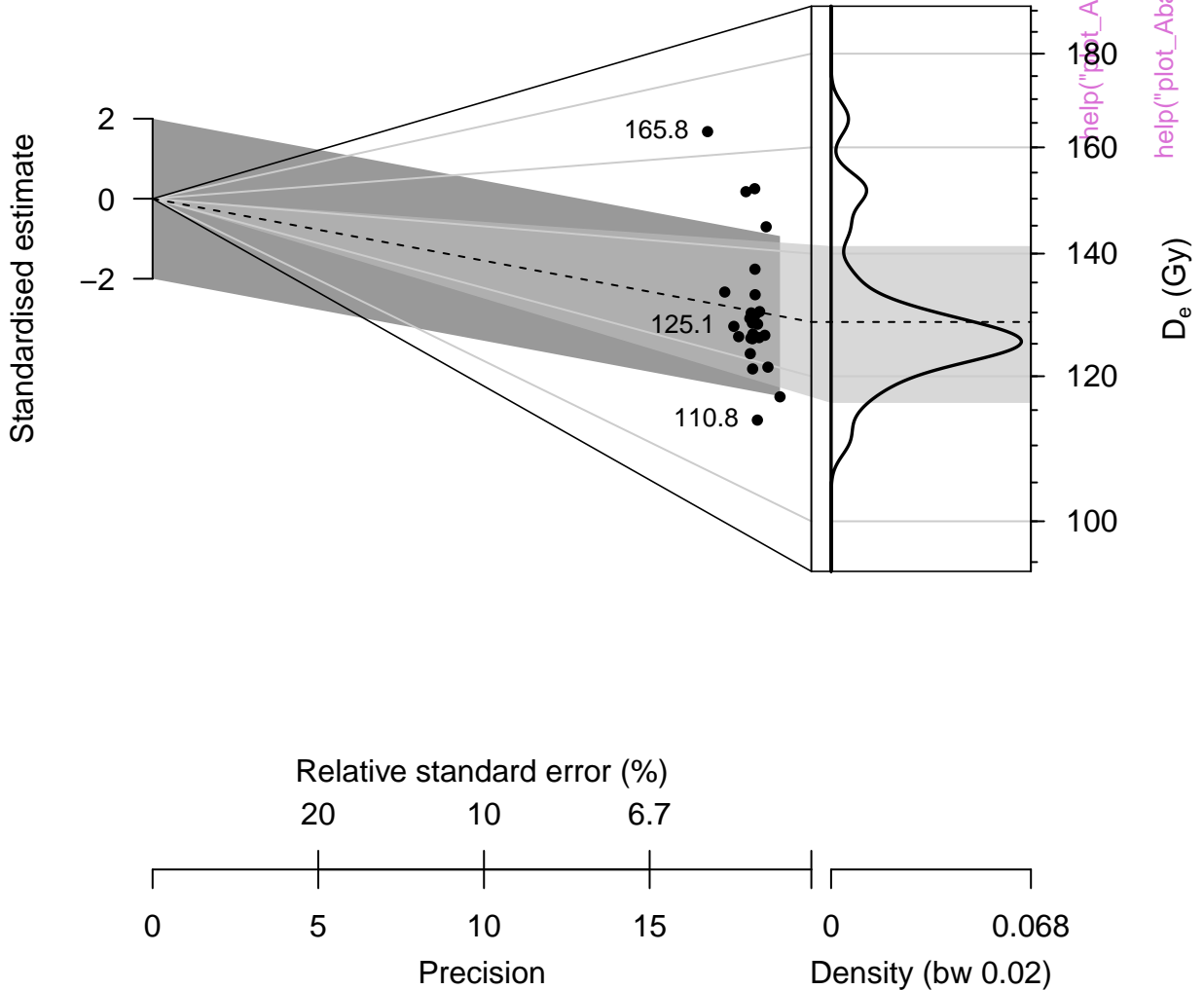
D_e distribution

n = 25 | in confidence interval = 76 %



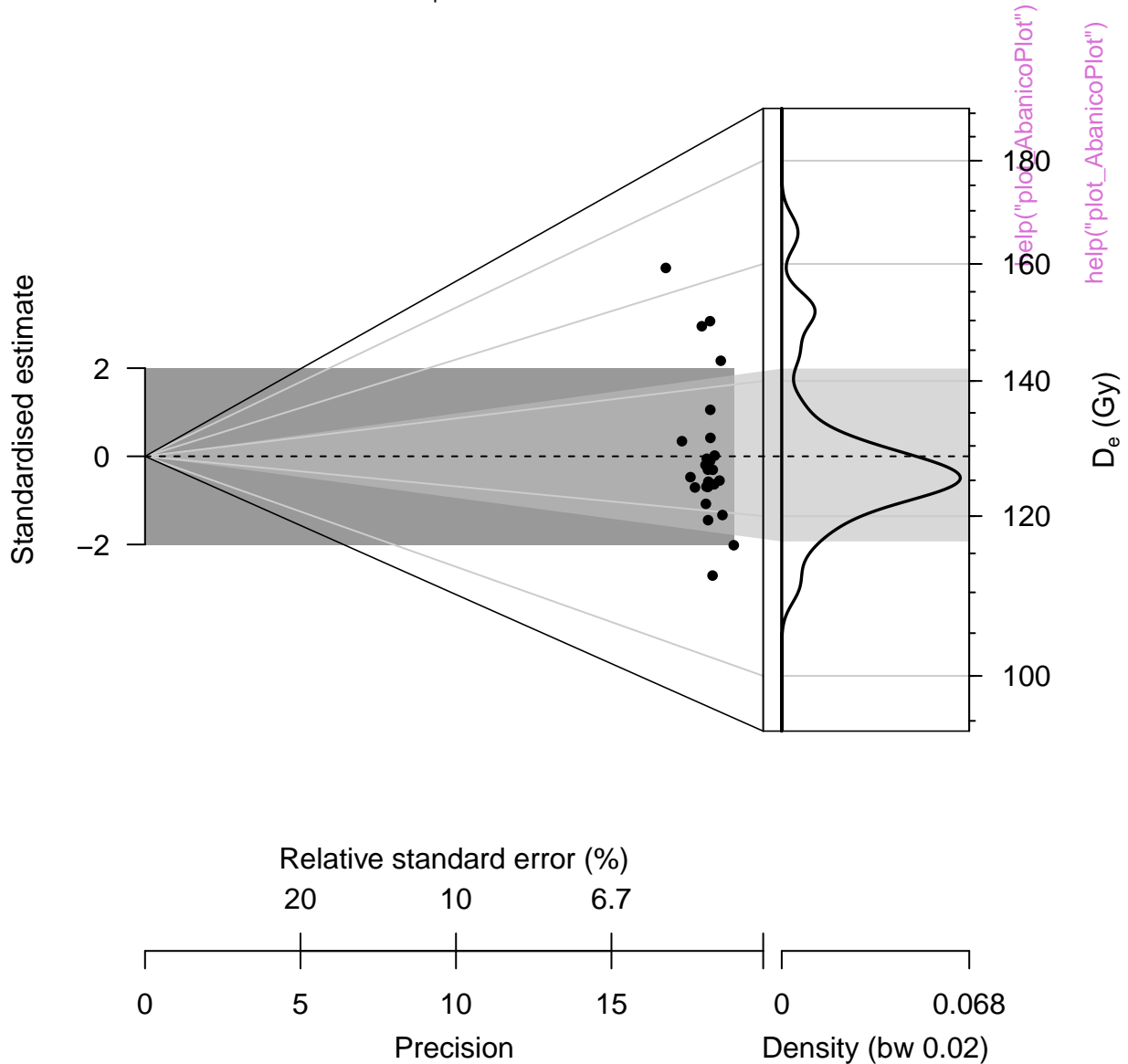
D_e distribution

n = 25 | in confidence interval = 76 %



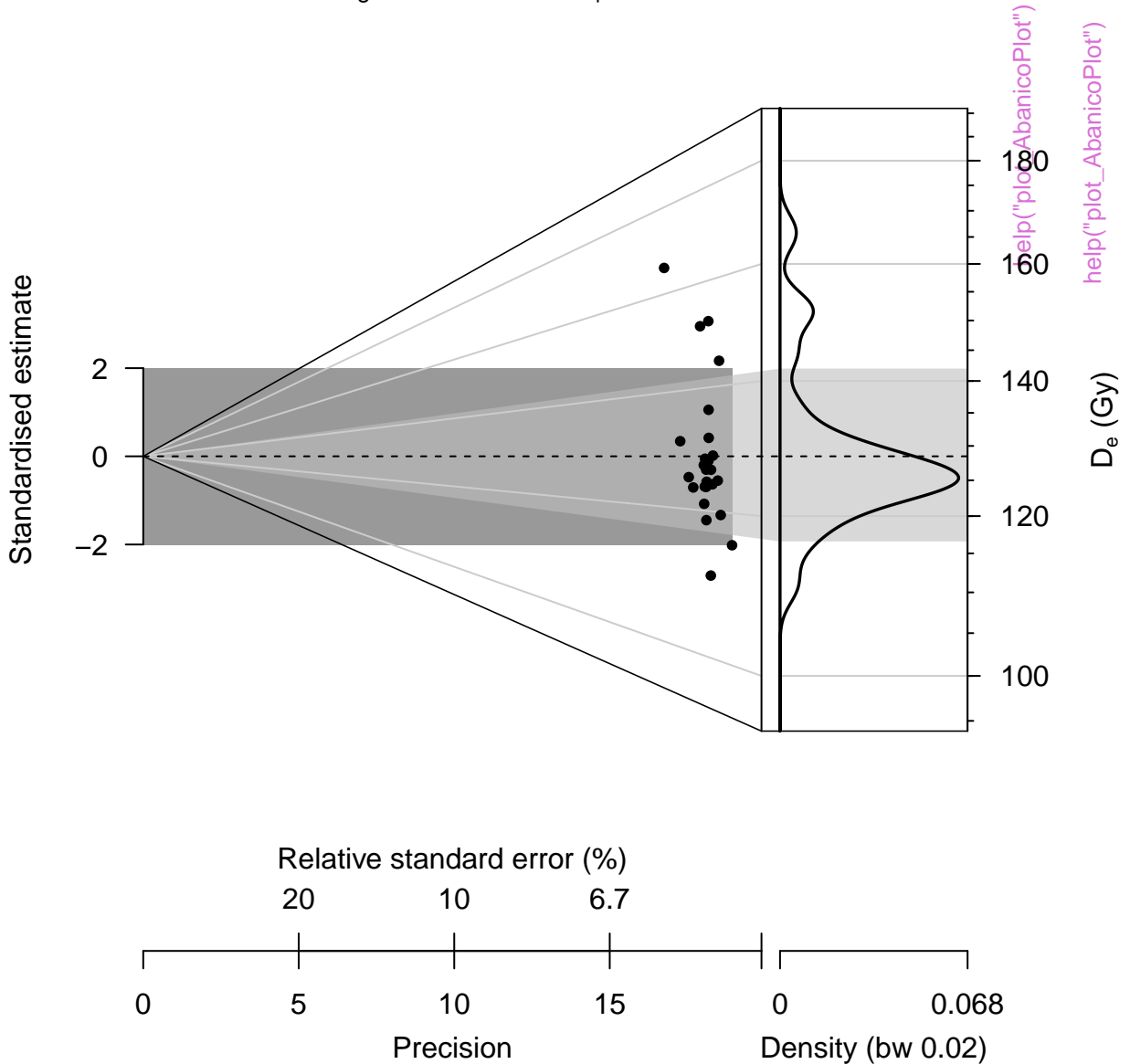
D_e distribution

n = 25 | in confidence interval = 76 %



D_e distribution

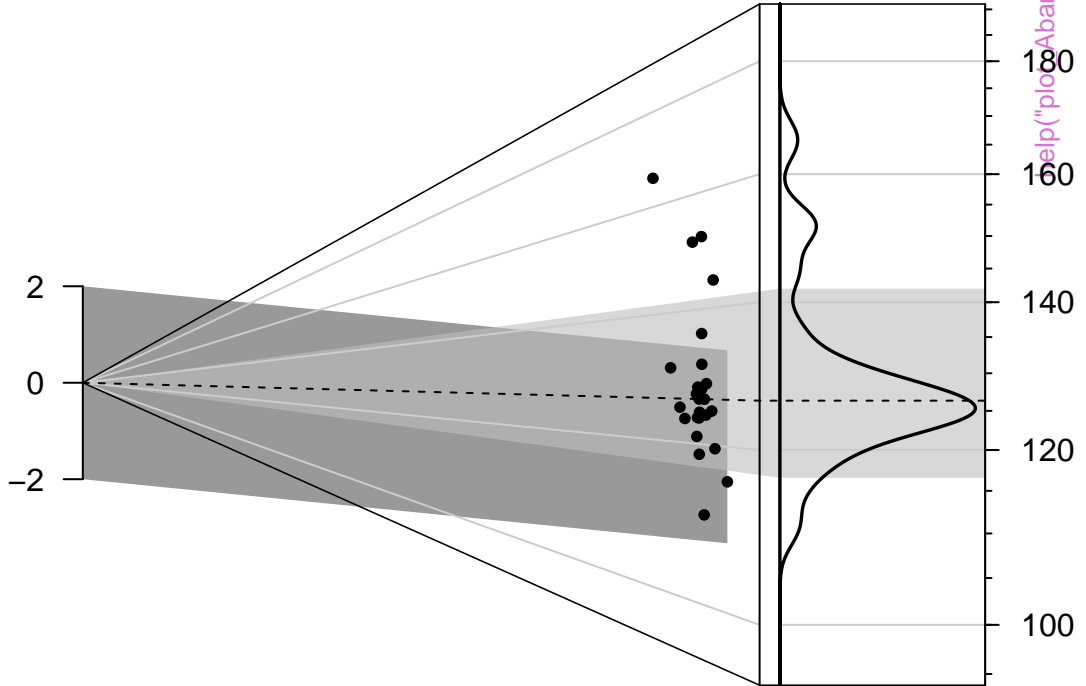
weighted mean = 128.12 | median = 126.34



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

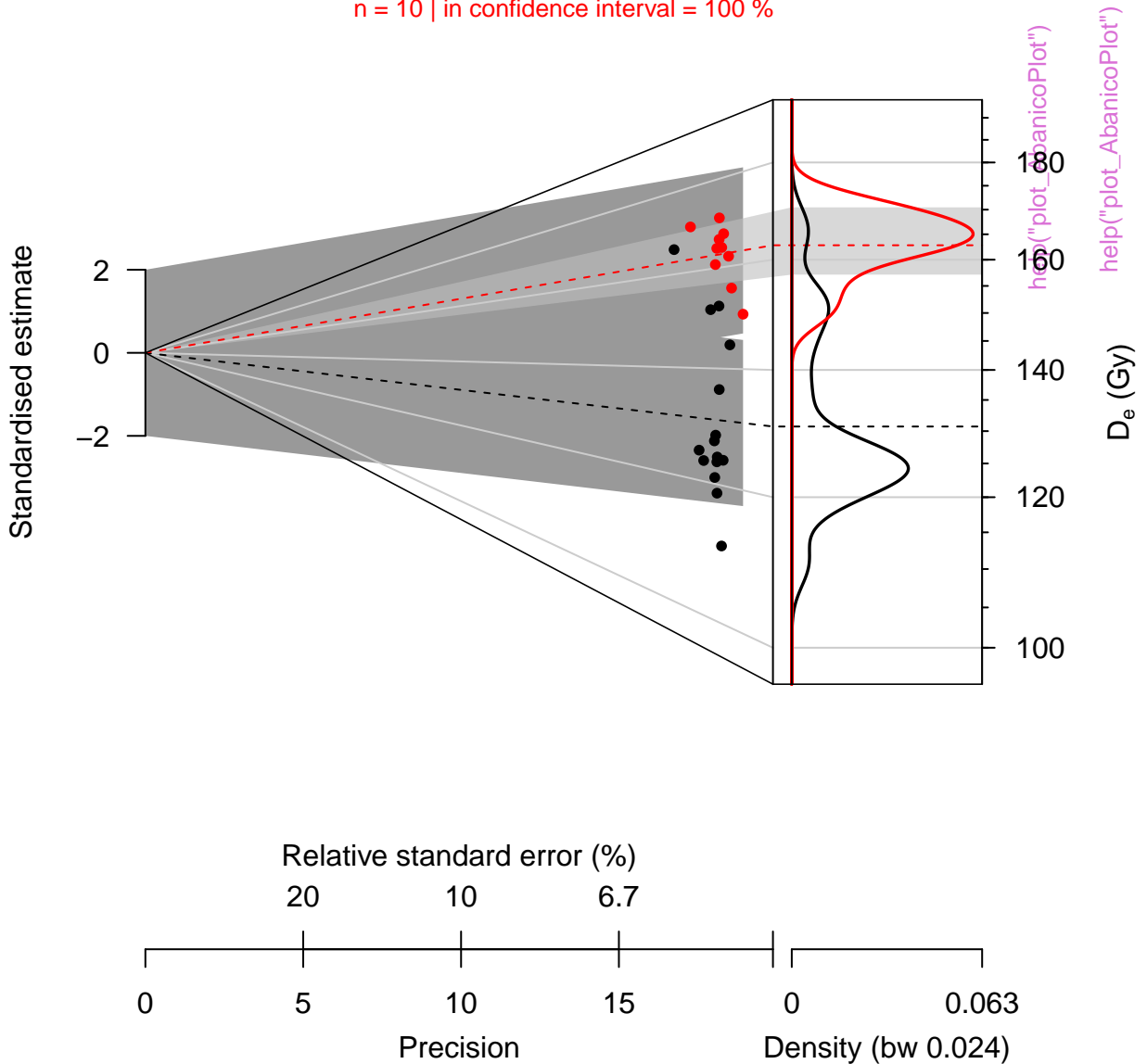
Precision

Density (bw 0.02)

D_e distribution

n = 15 | in confidence interval = 73.3 %

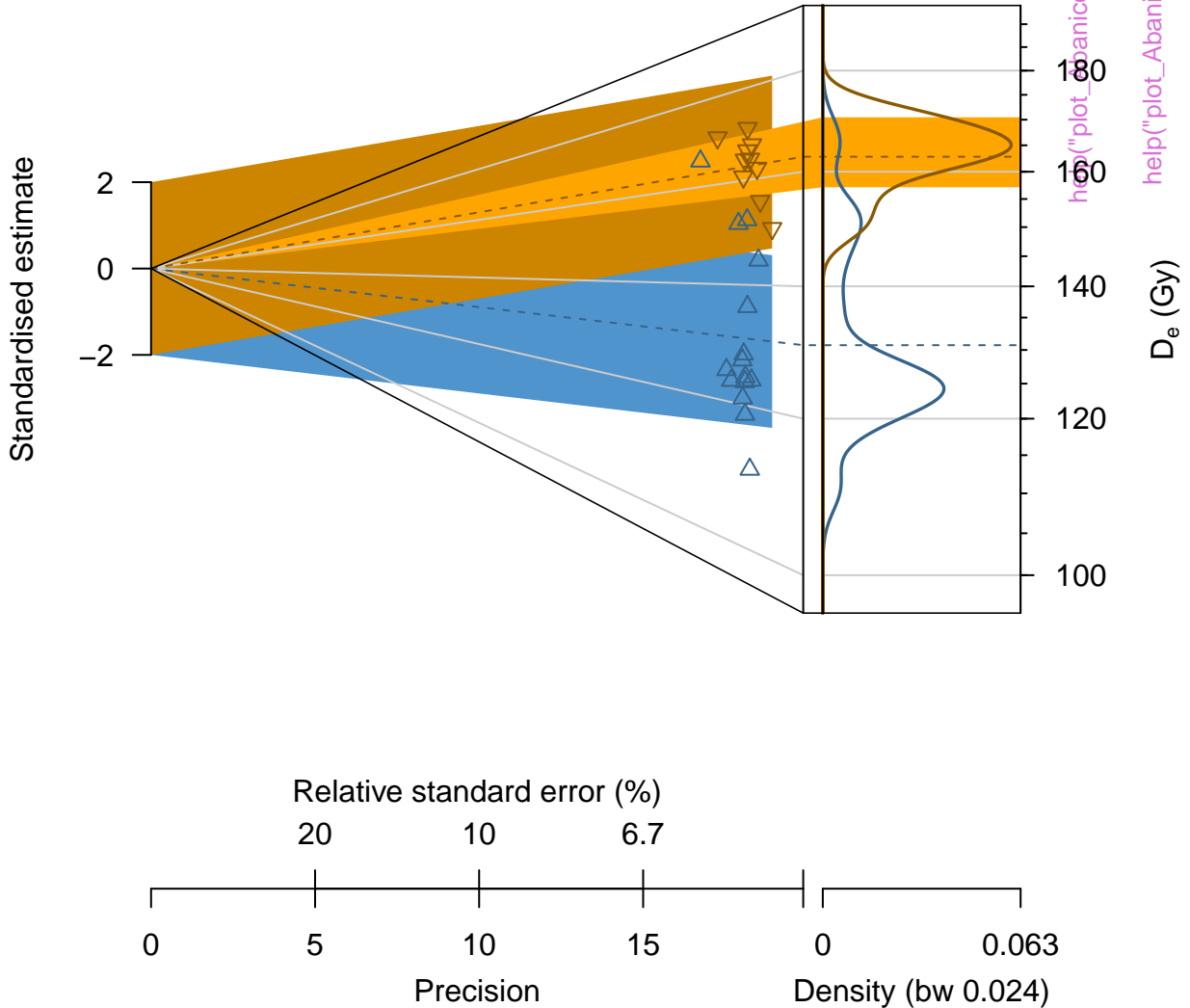
n = 10 | in confidence interval = 100 %

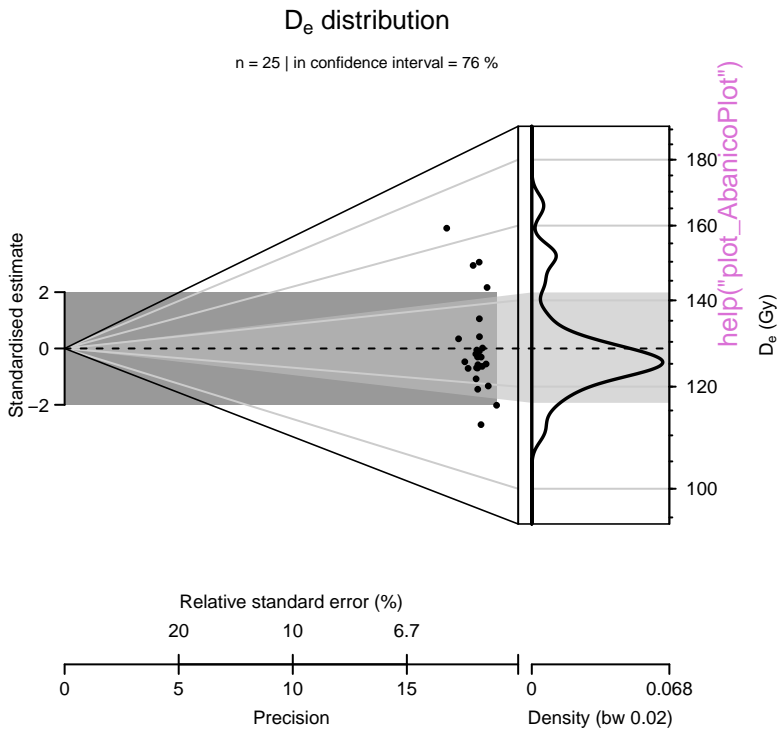


D_e distribution

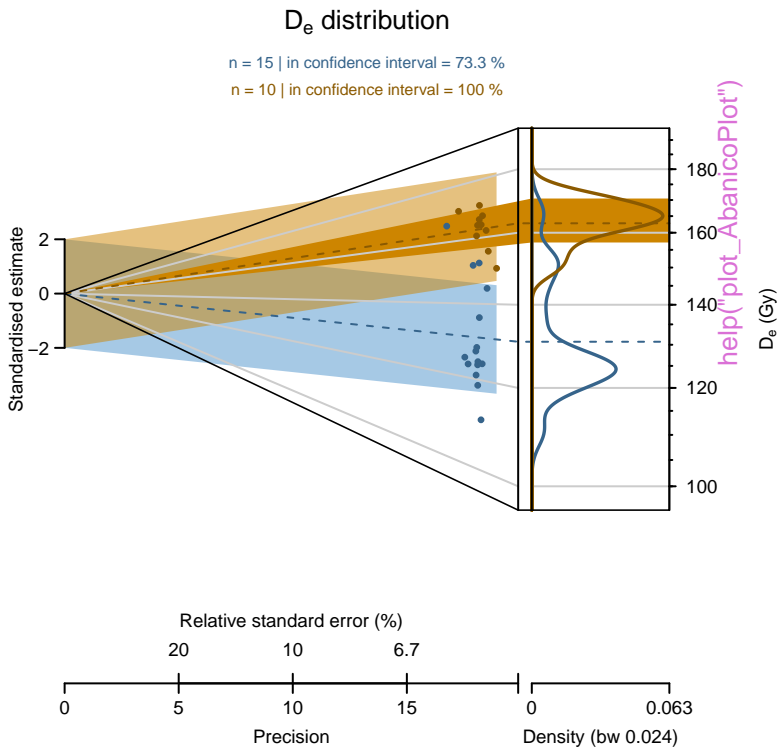
n = 15 | in confidence interval = 73.3 %

n = 10 | in confidence interval = 100 %





`help("plot_AbanicoPlot")`



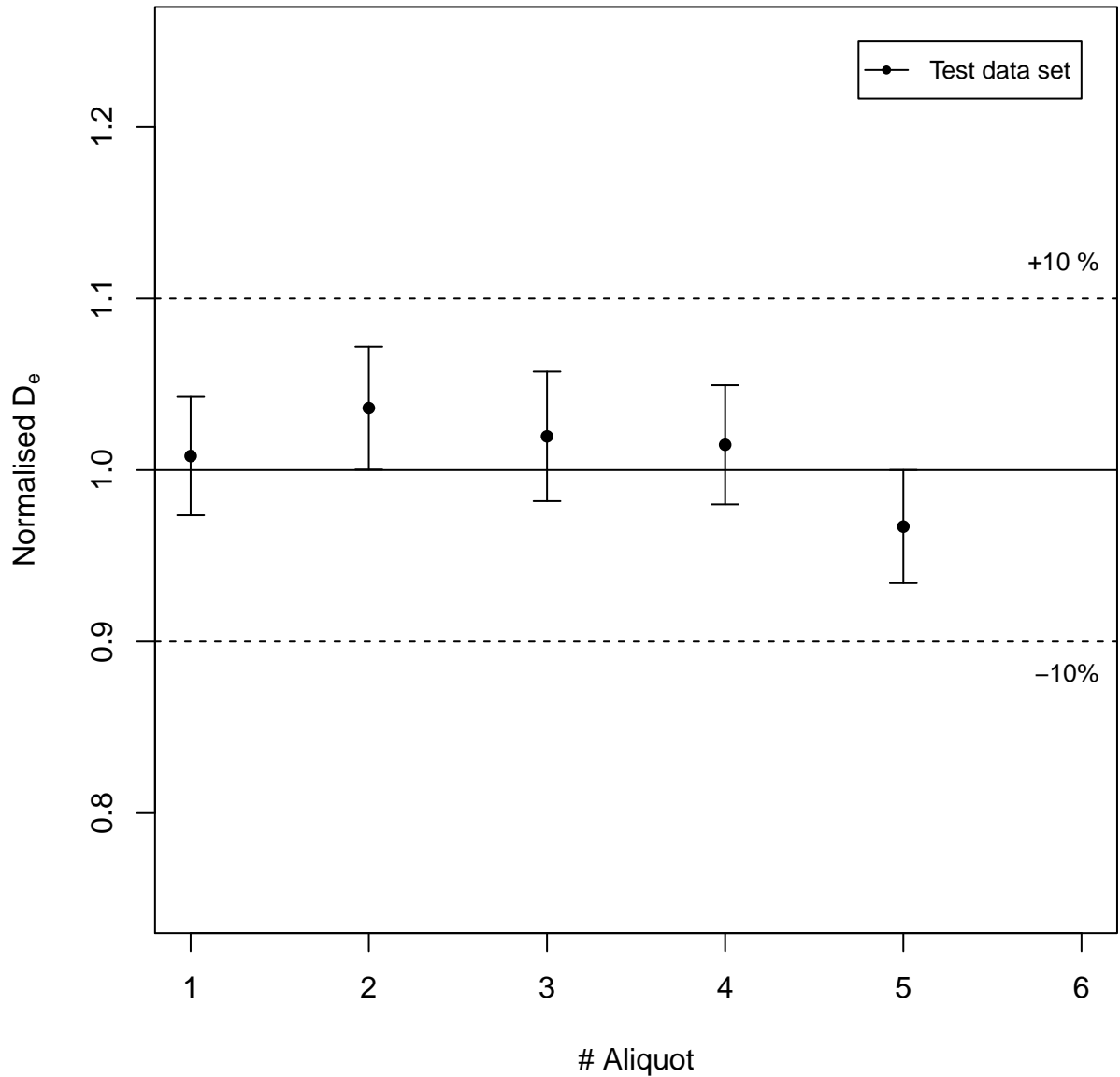
`help("plot_AbanicoPlot")`

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

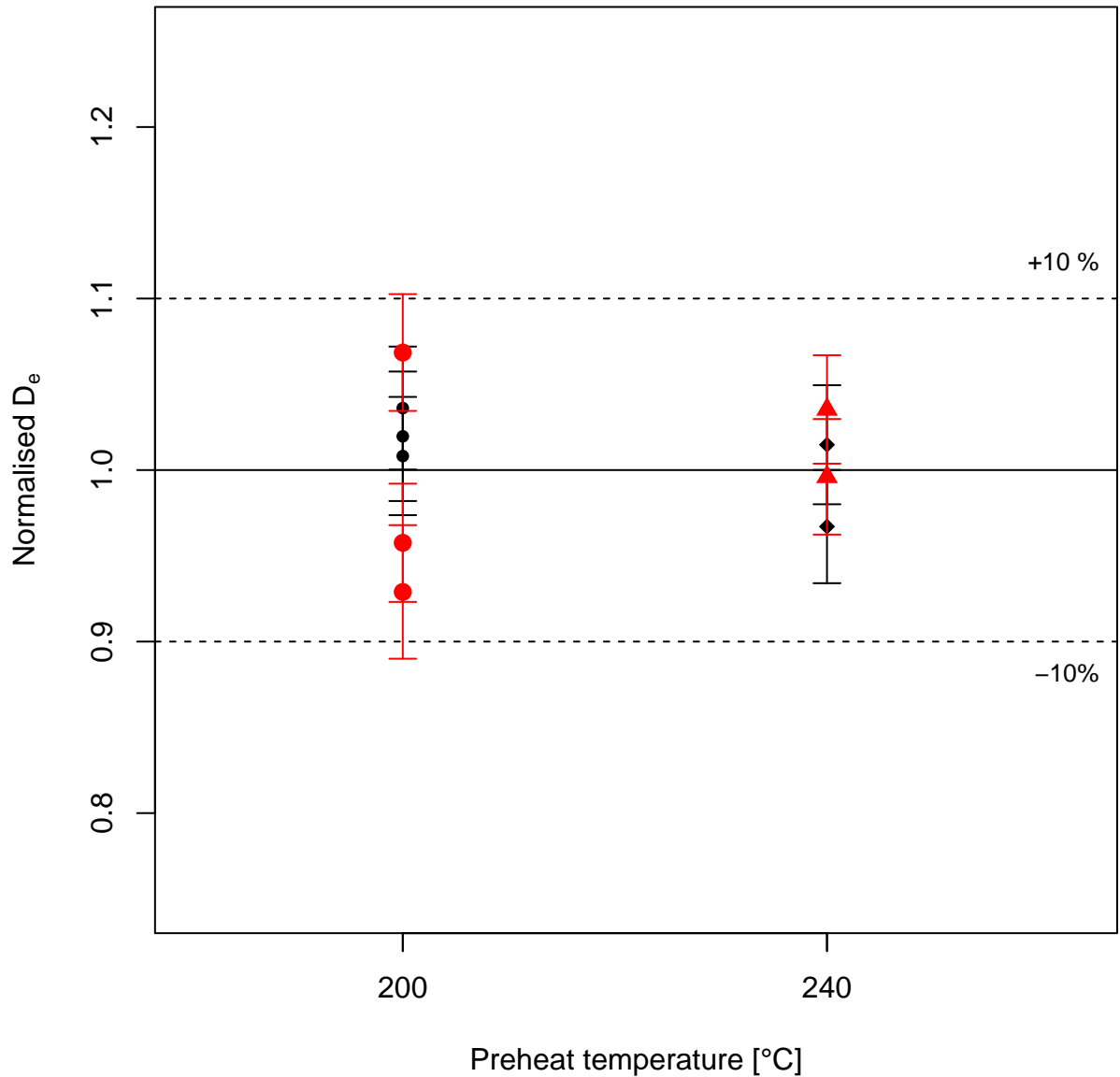


Dose recovery test

Example data



Dose recovery test

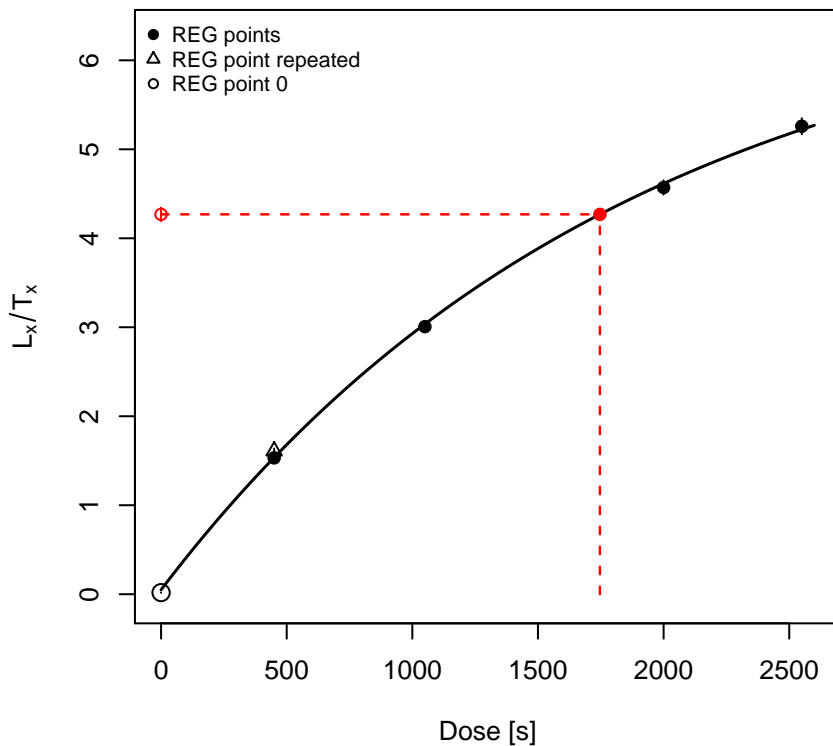


Dose recovery test

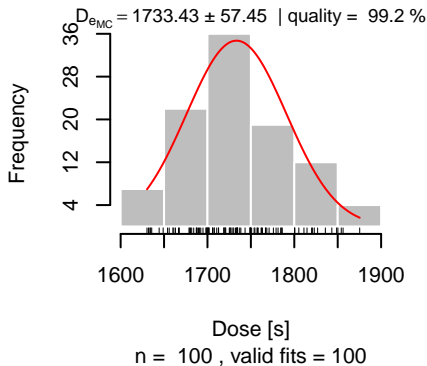


Growth curve

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



D_e from MC simulation

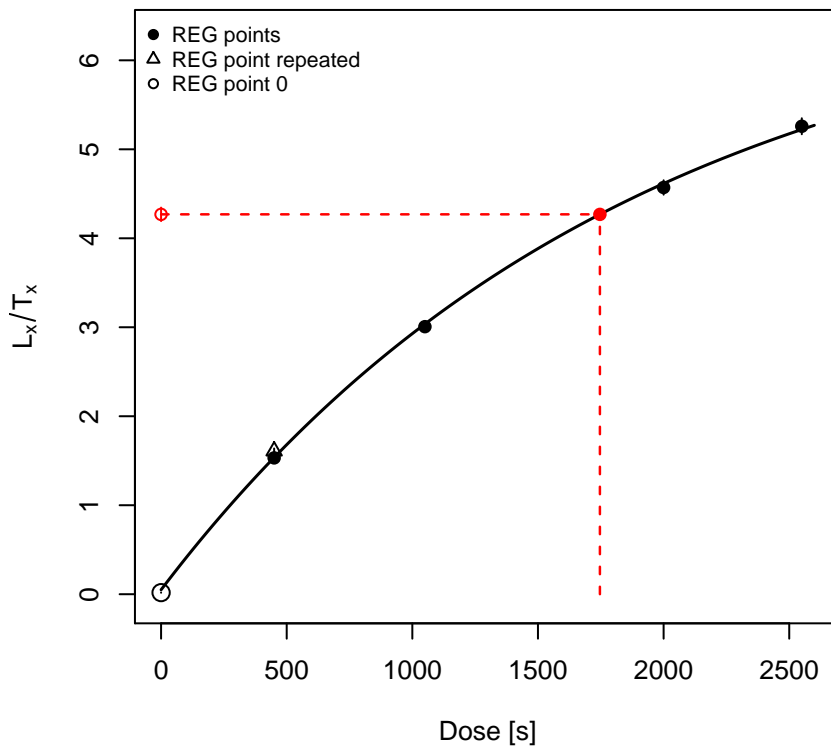


Test dose response



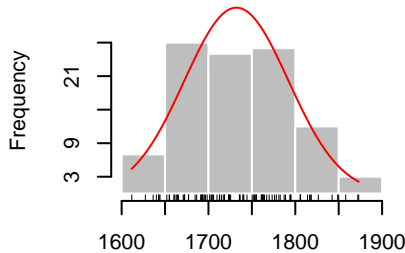
Growth curve

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



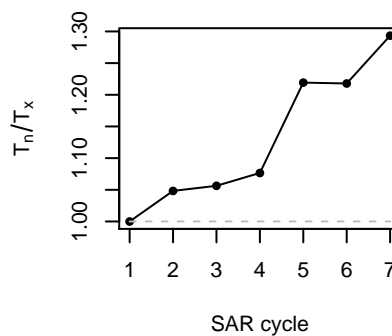
D_e from MC simulation

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

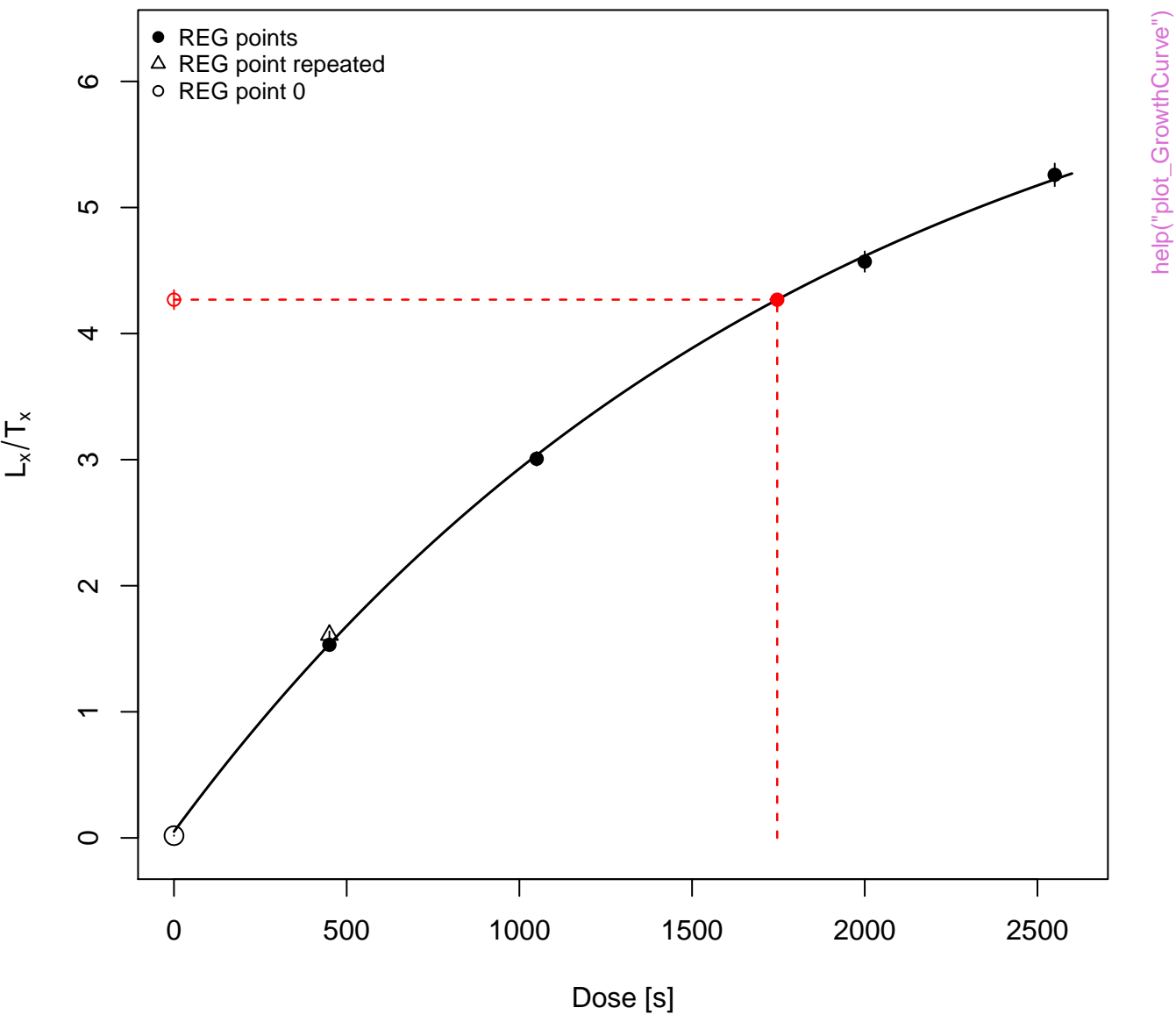


Dose [s]
n = 100 , valid fits = 100

Test dose response

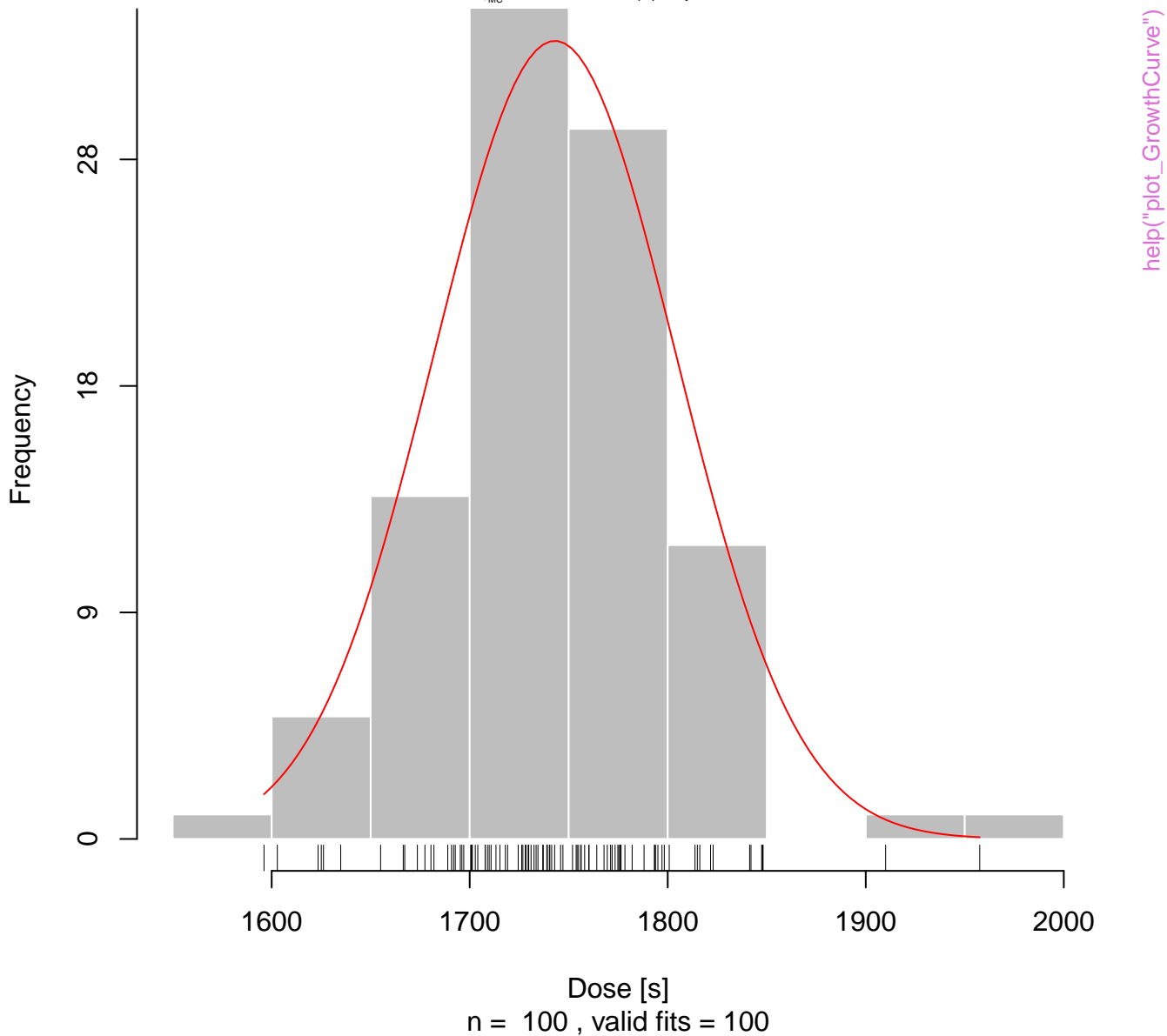


Growth curve

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


D_e from MC simulation

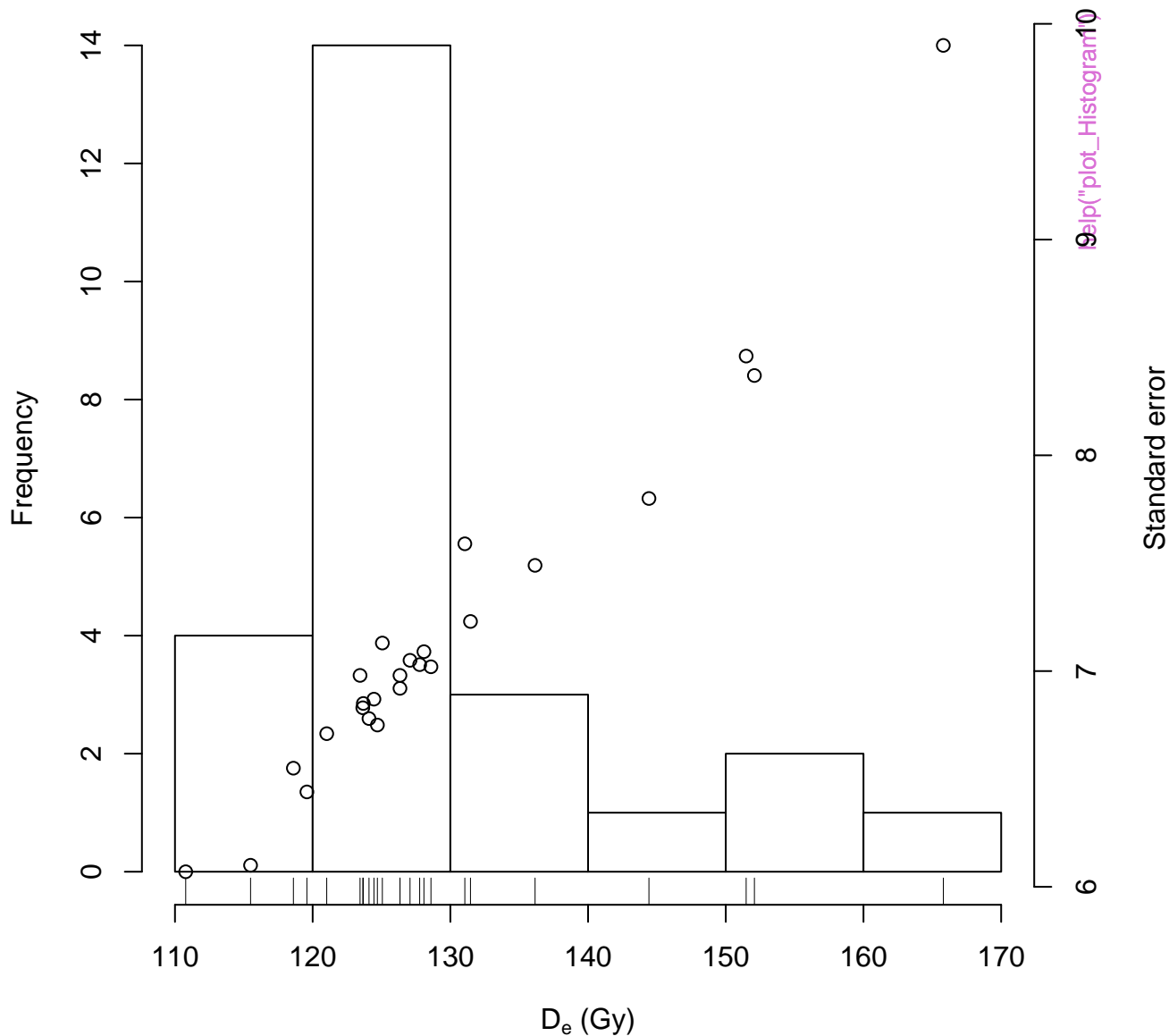
D_{MC} = 1743.04 ± 61.2 | quality = 99.8 %



Test dose response

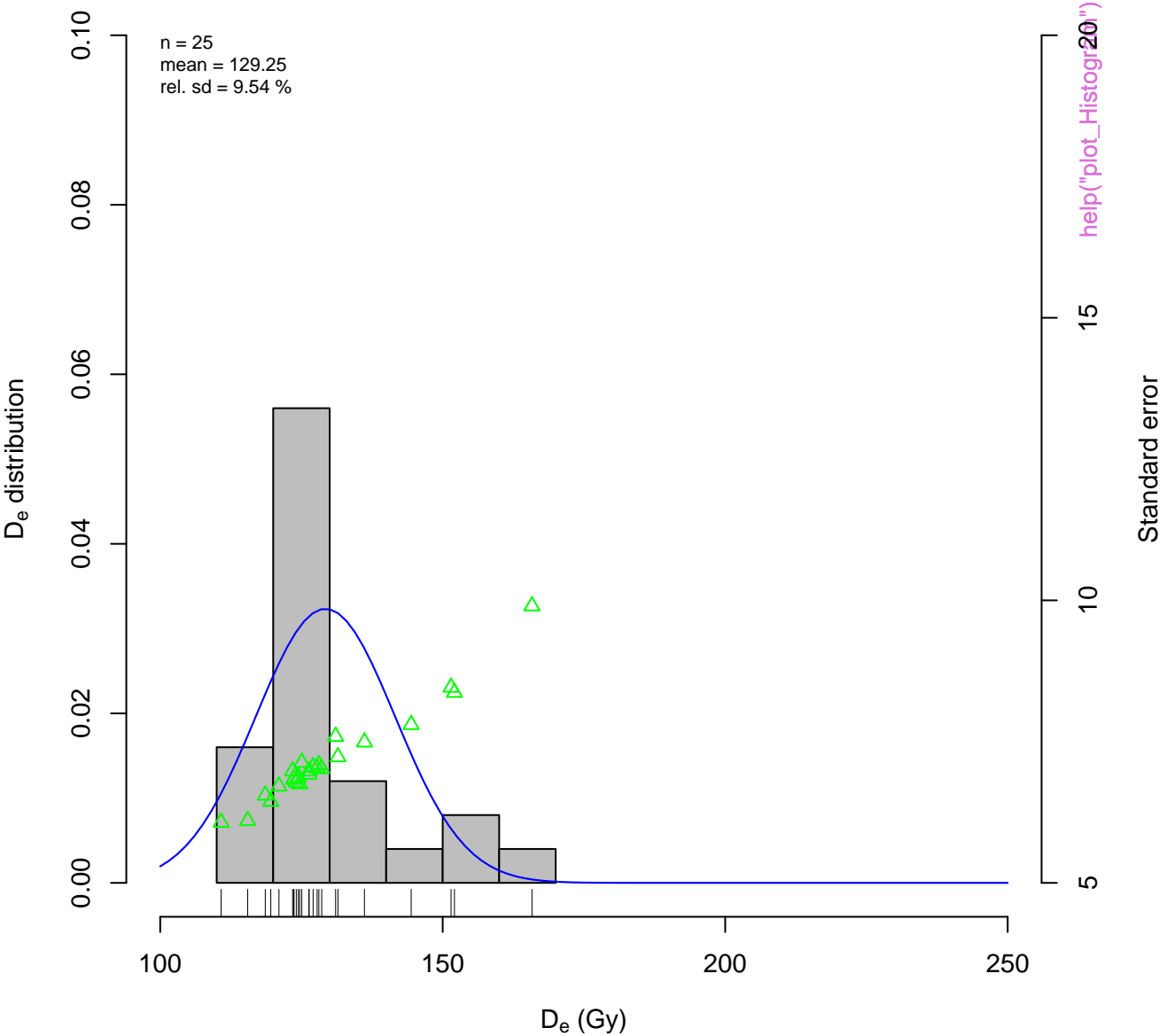


Histogram

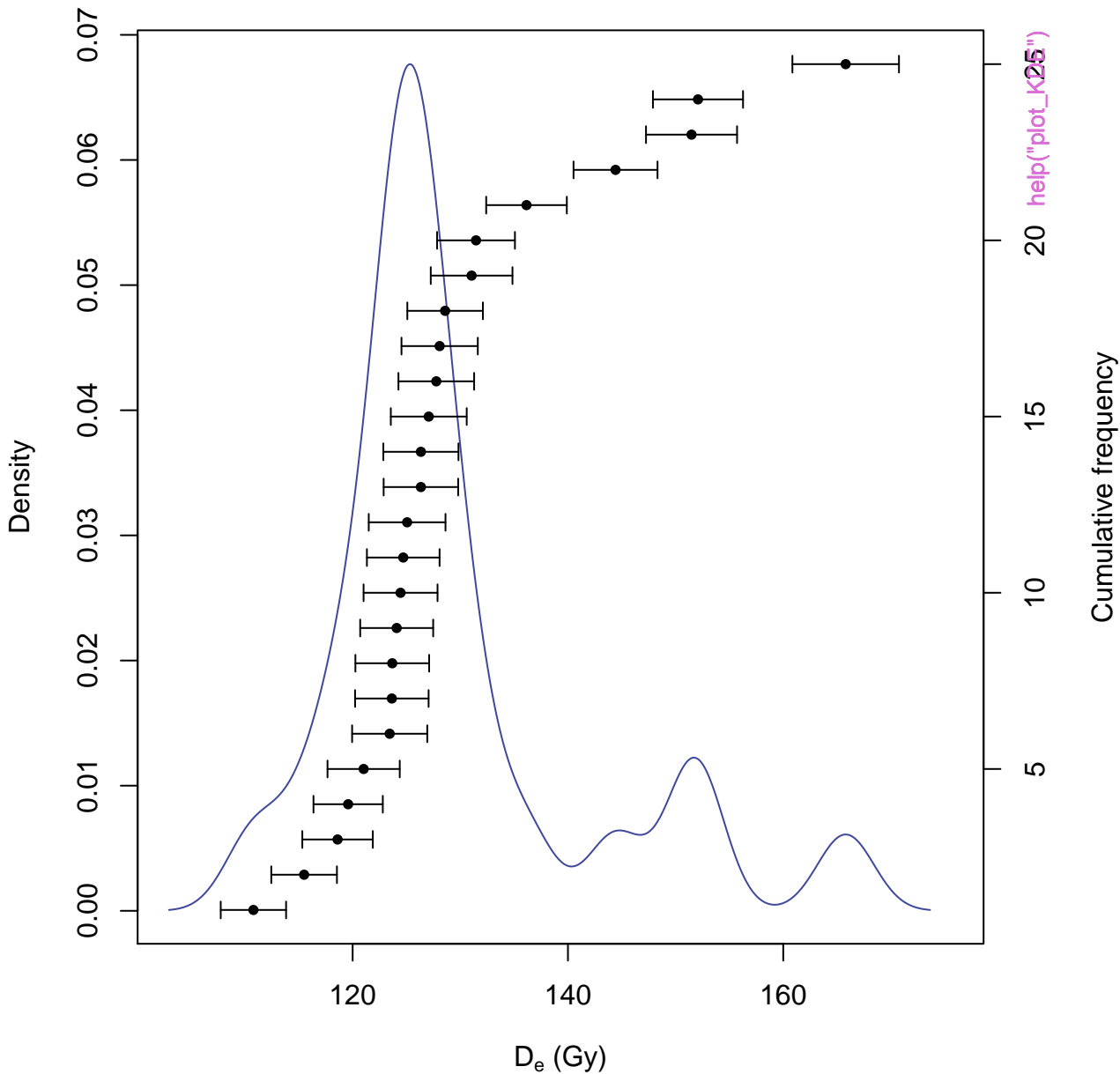


Histogram of De-values

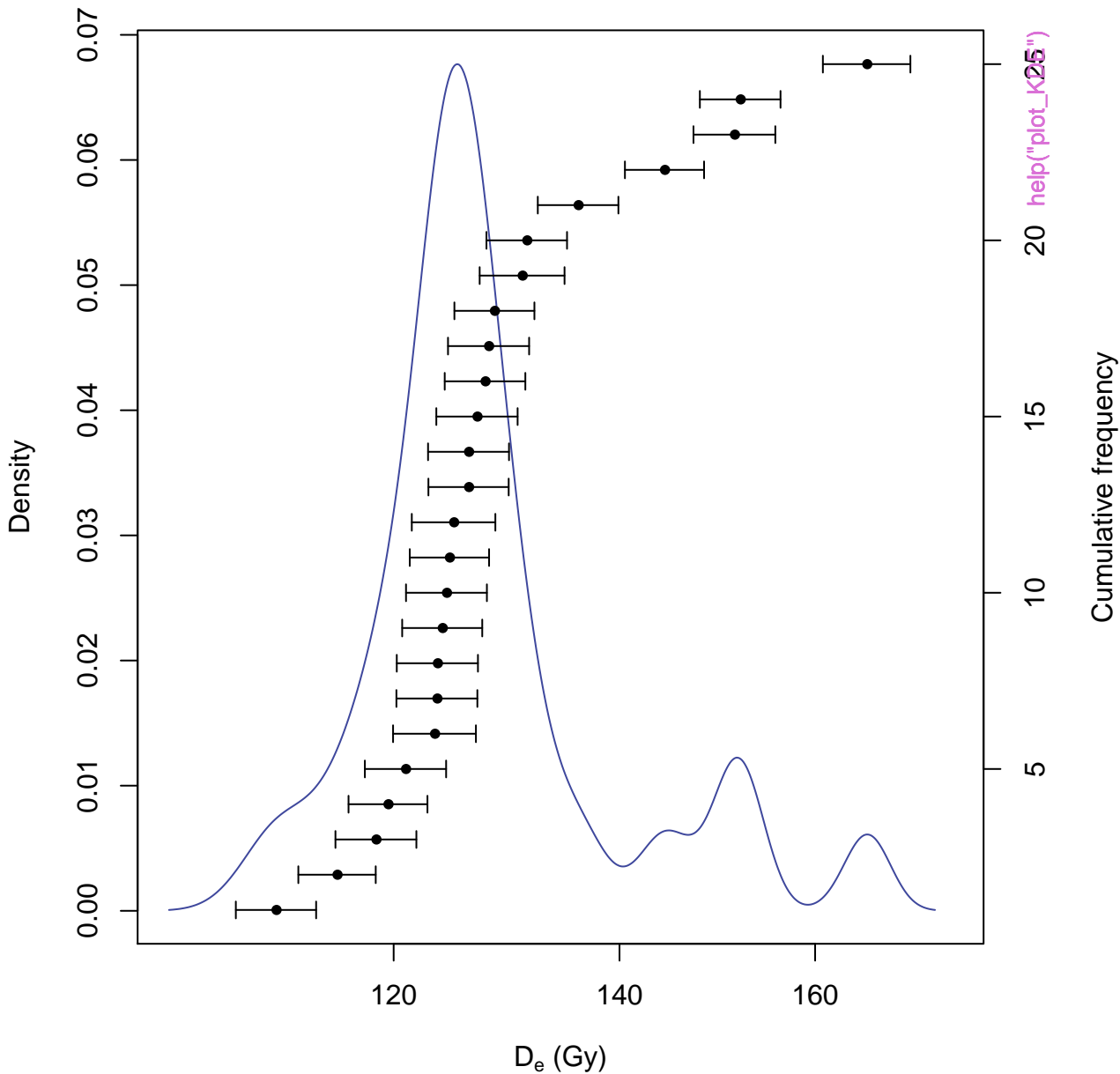
Example data set



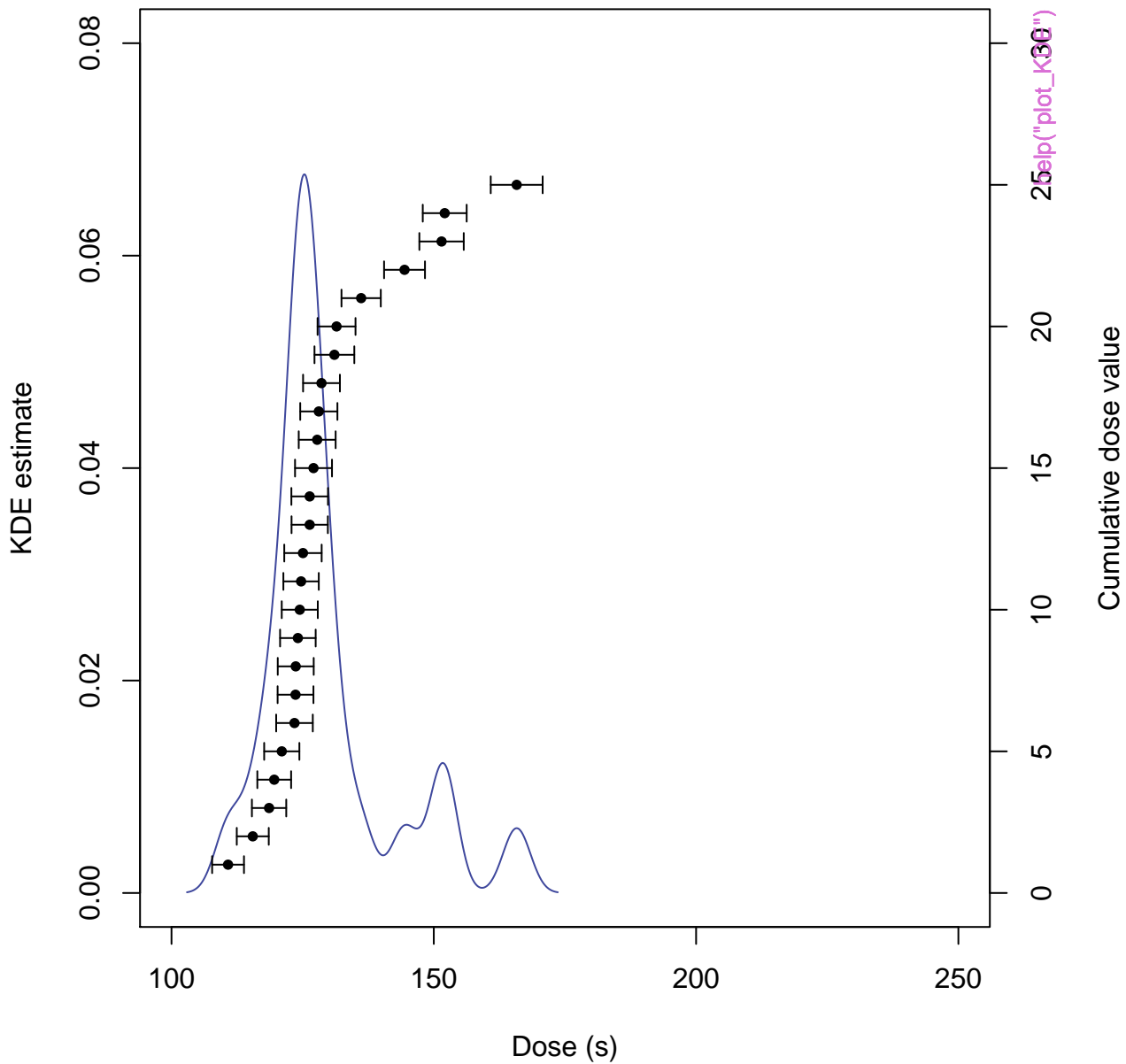
D_e distribution



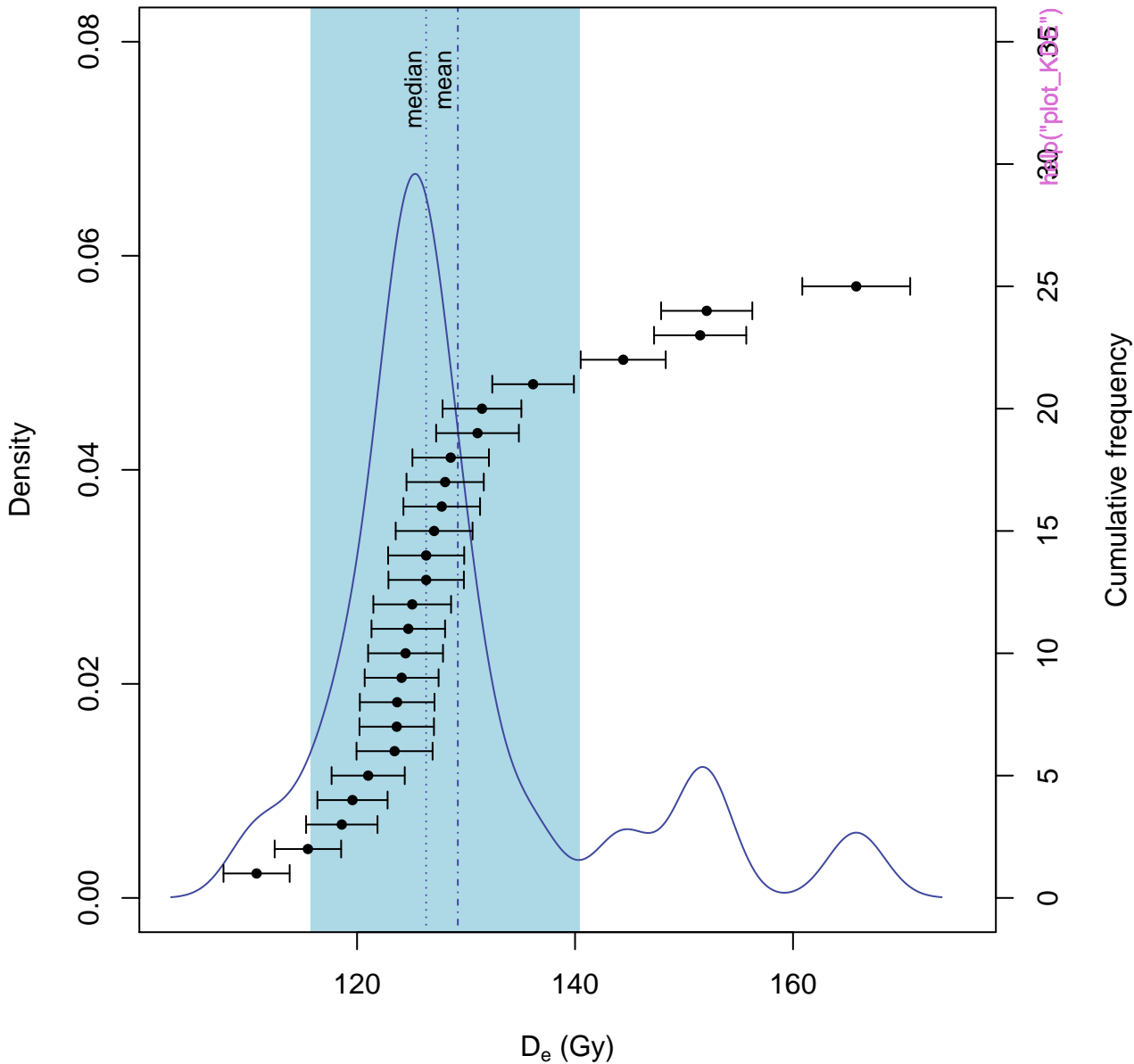
D_e distribution



Dose distribution

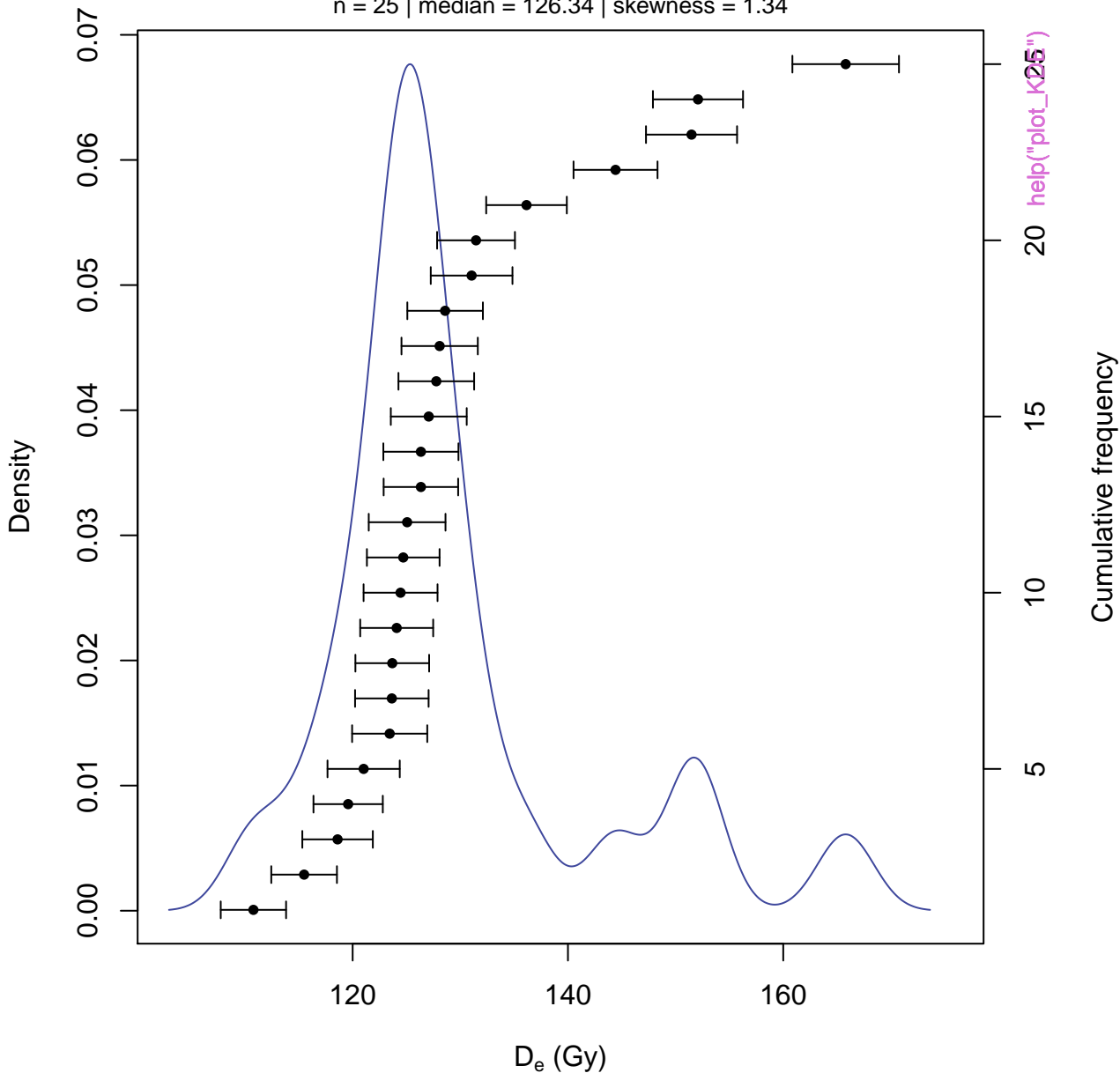


D_e distribution

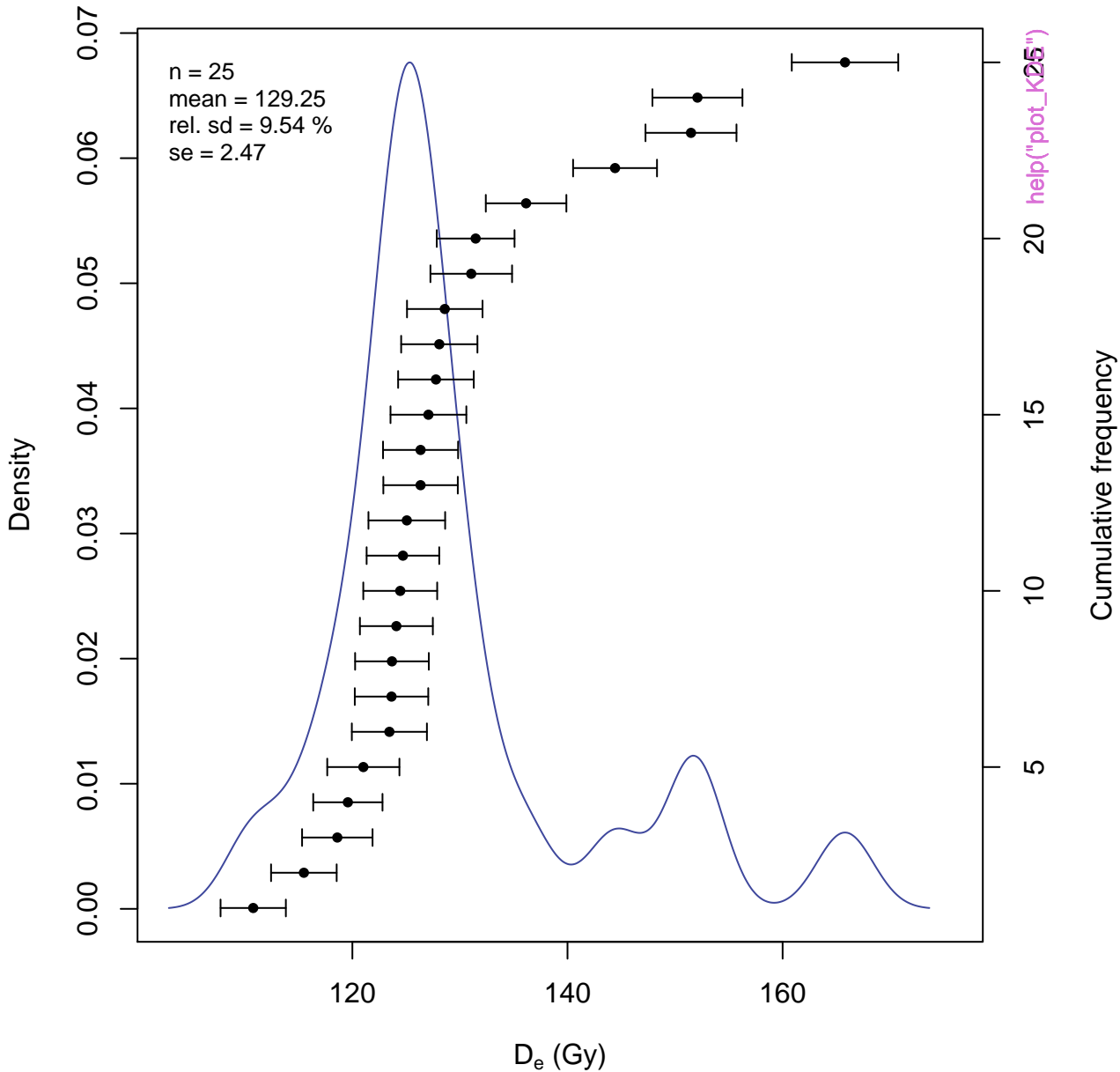


D_e distribution

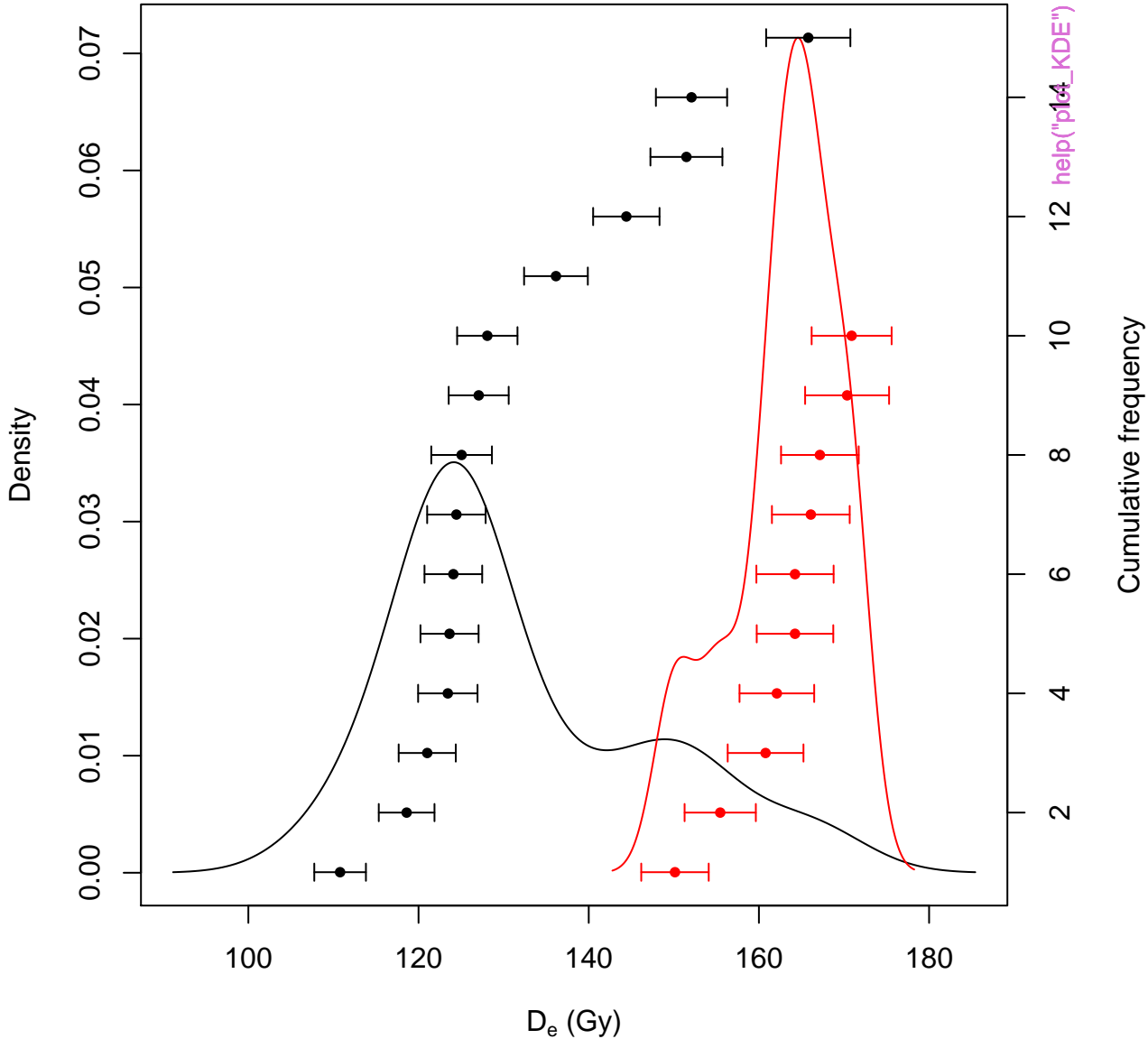
n = 25 | median = 126.34 | skewness = 1.34



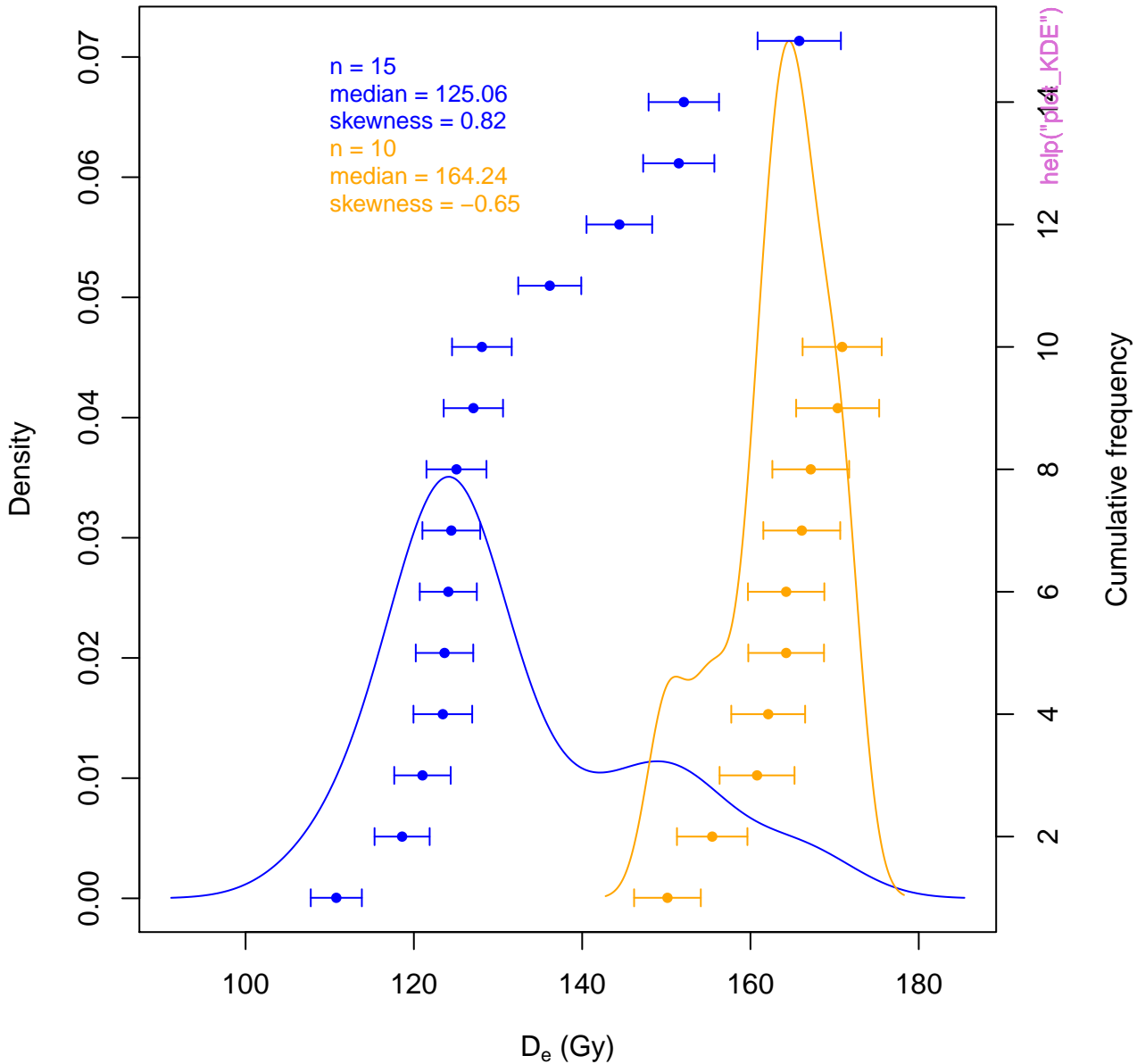
D_e distribution



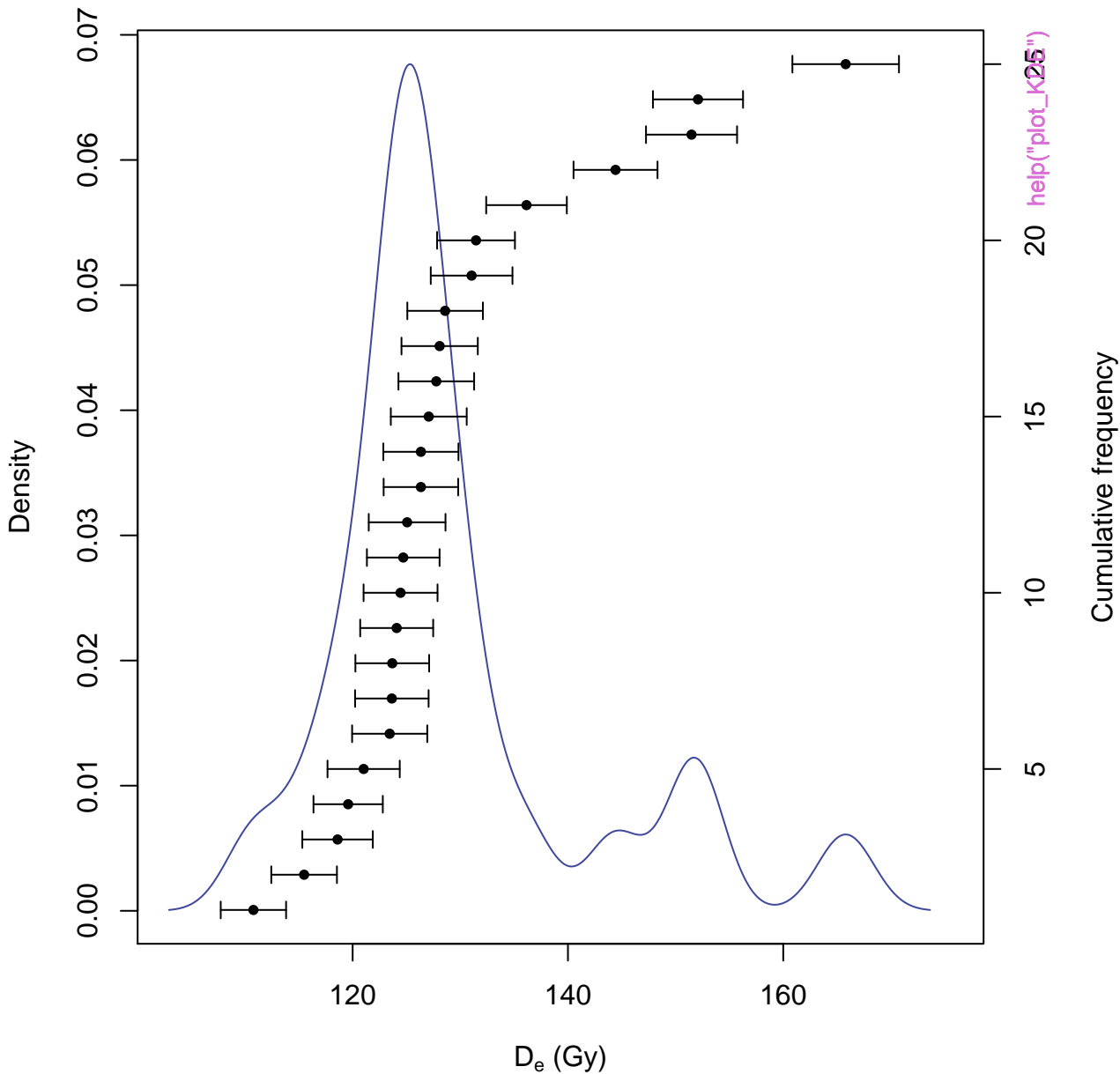
D_e distribution



D_e distribution



D_e distribution



NR(t) Plot

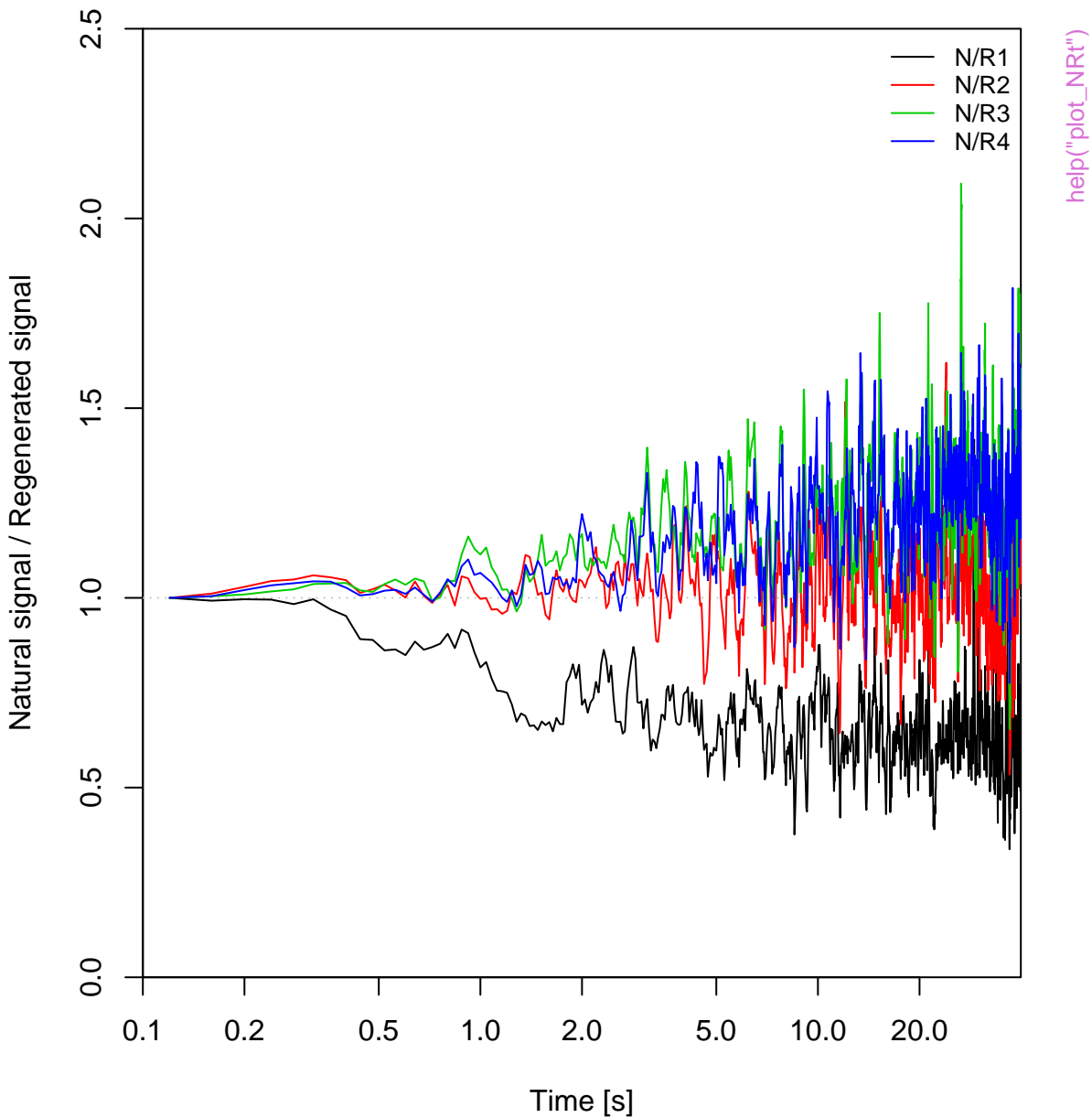


NR(t) Plot



help("plot_NRt")

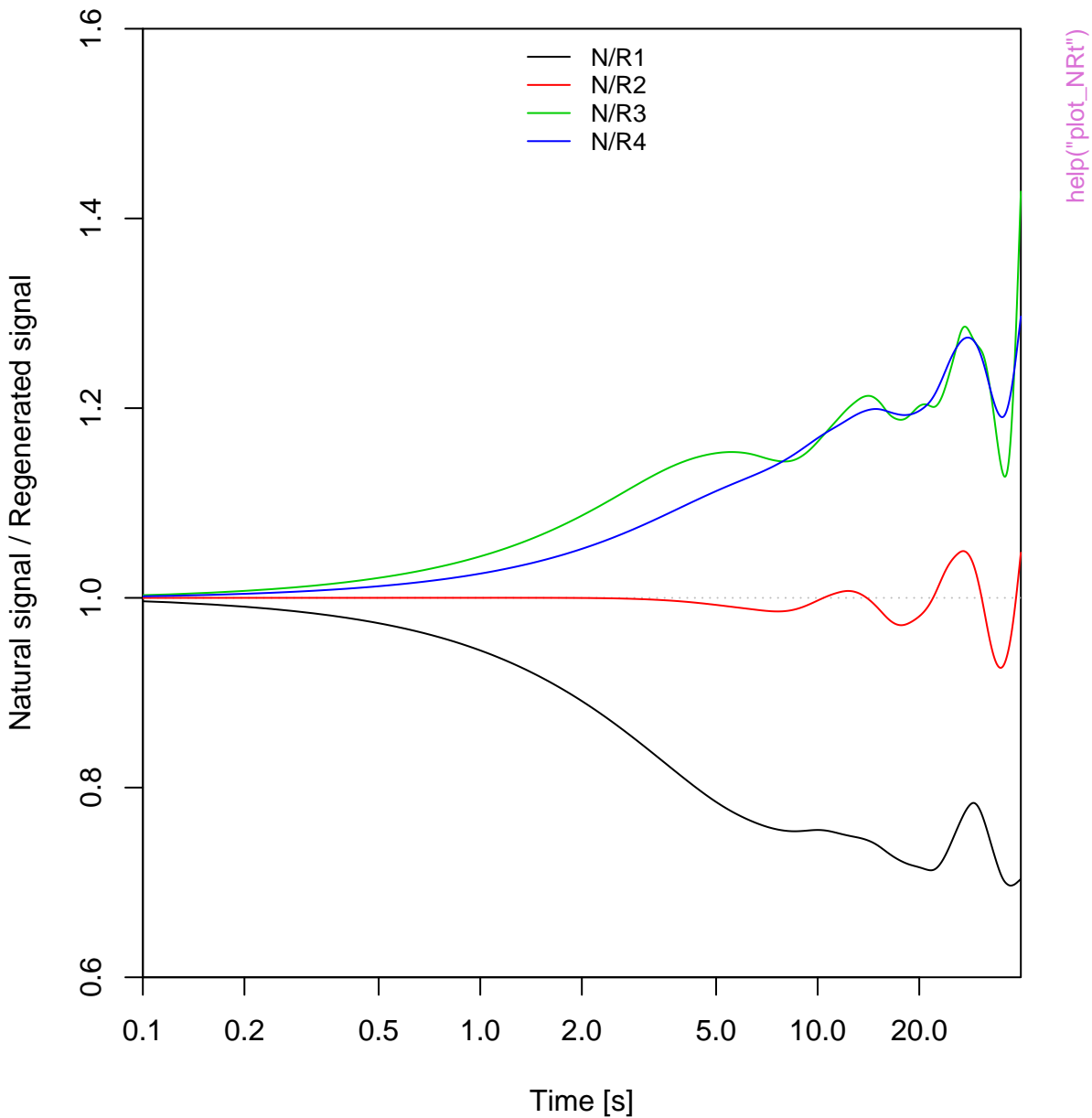
NR(t) Plot



NR(t) Plot

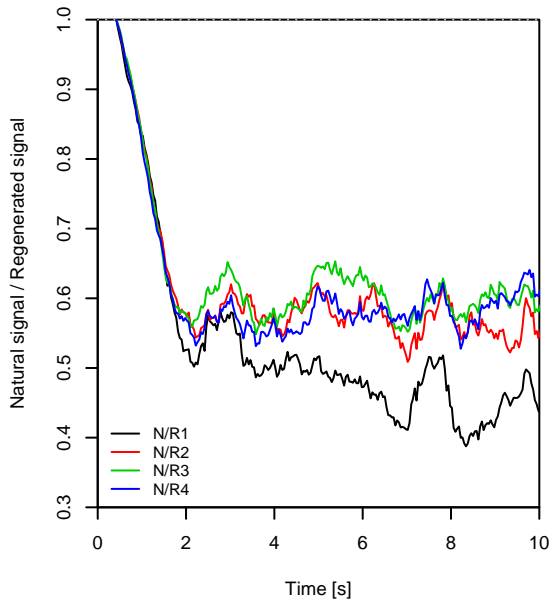
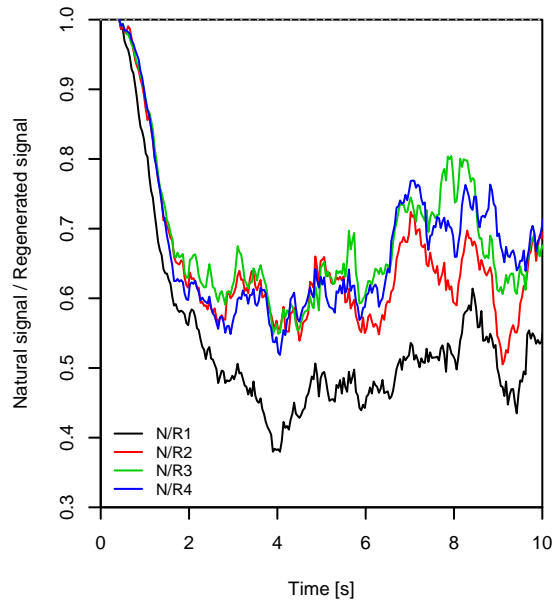


NR(t) Plot

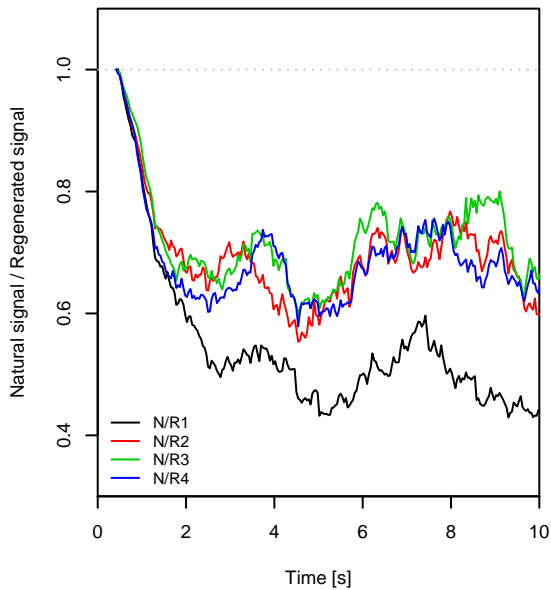
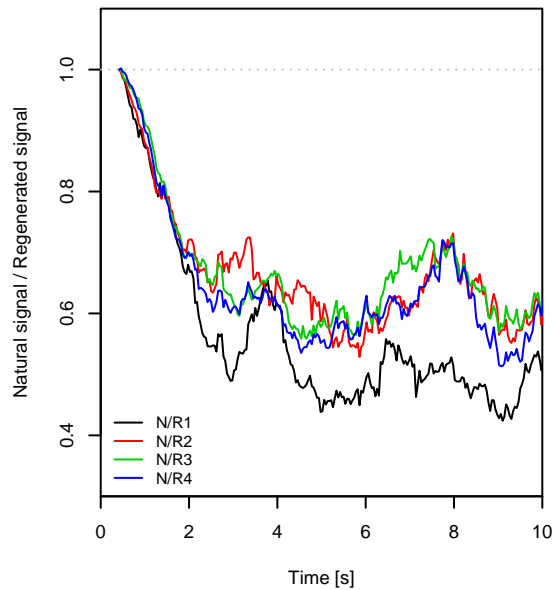


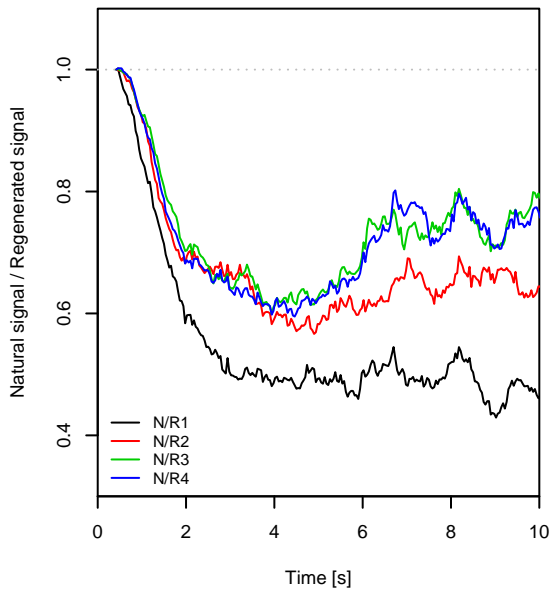
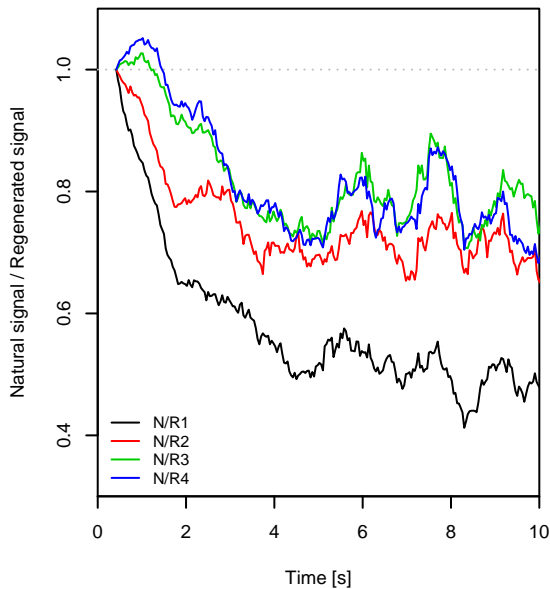
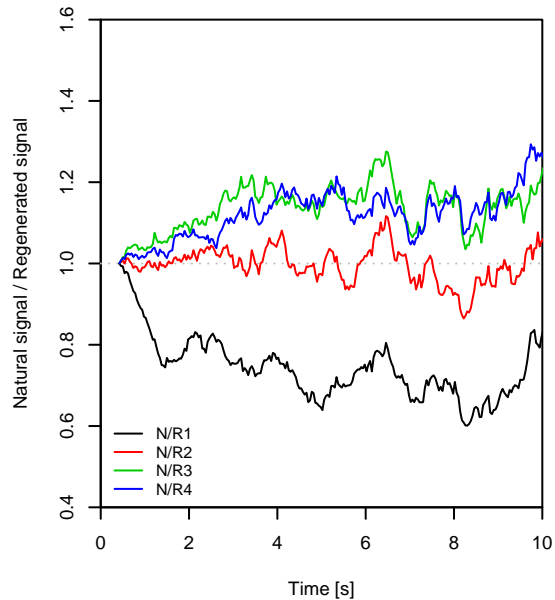
TnTx(t) Plot

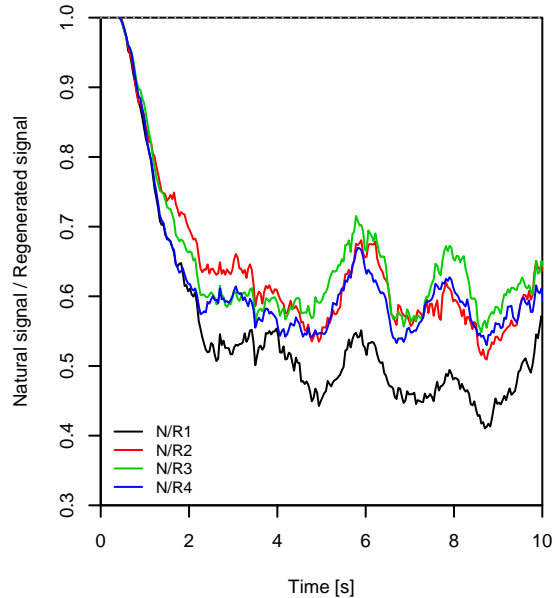


Aliquot #1**Aliquot #2**

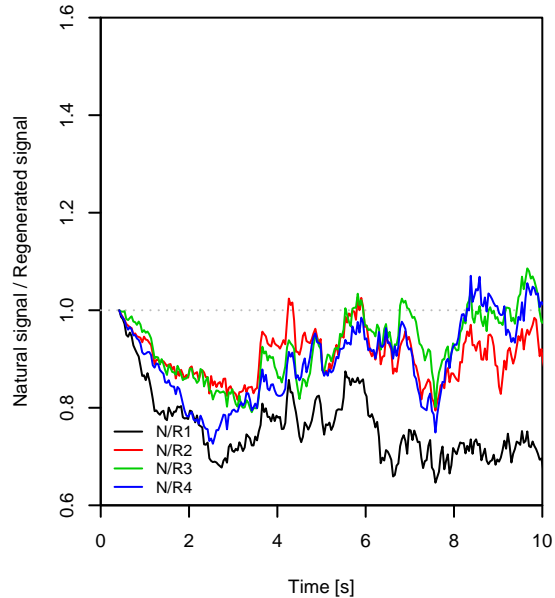
help("plot_NRt")

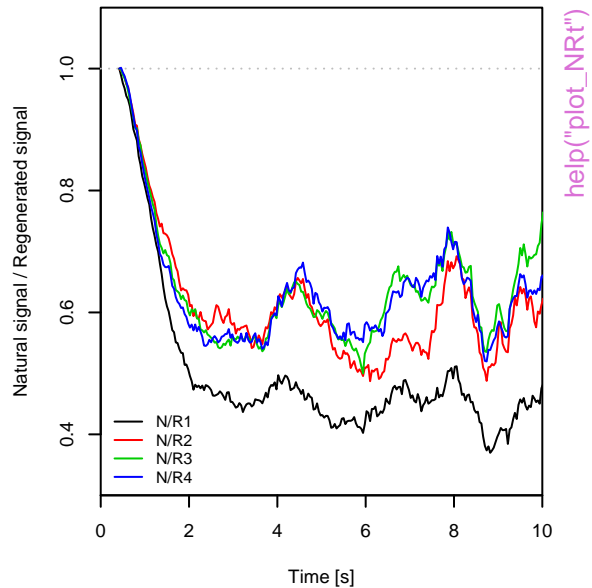
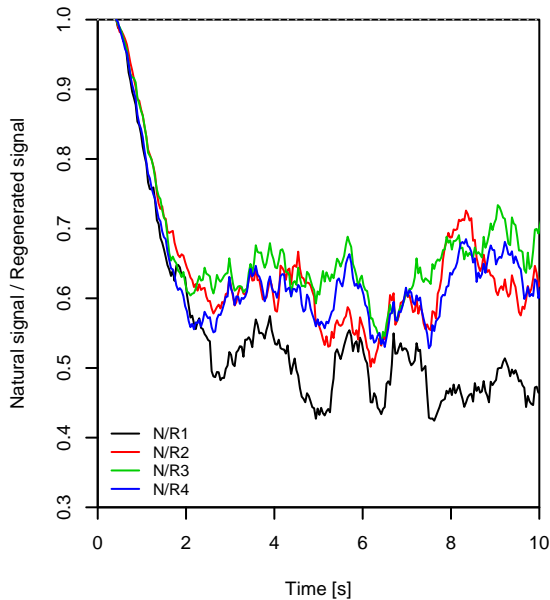
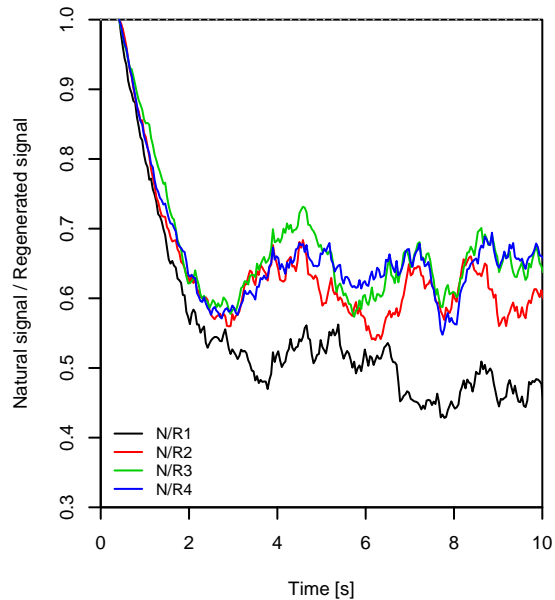
Aliquot #3**Aliquot #4**

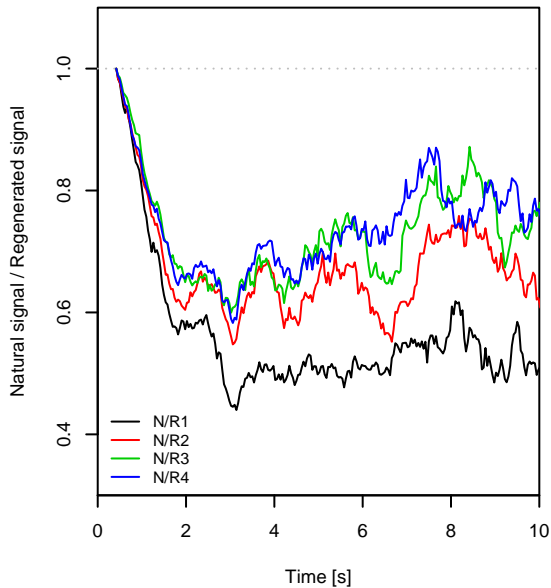
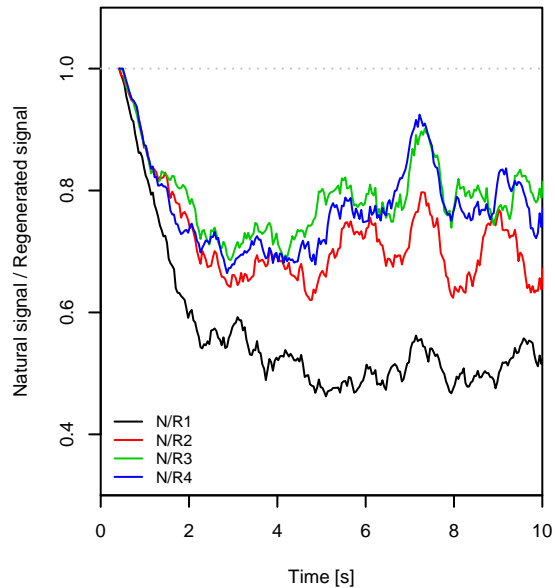
Aliquot #5**Aliquot #6****Aliquot #7****Aliquot #8**

Aliquot #9**Aliquot #10**

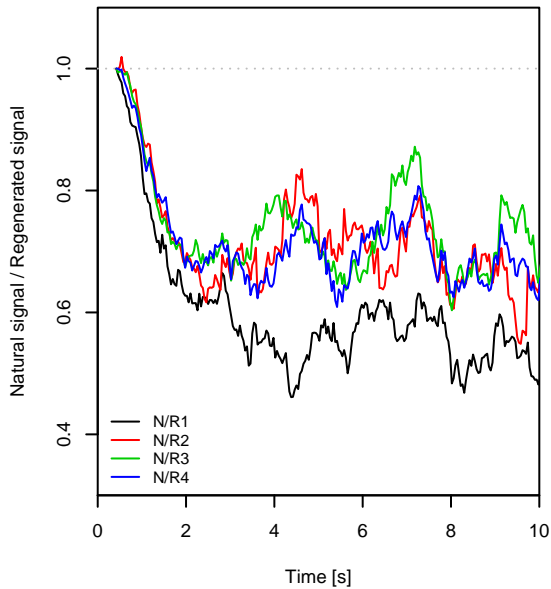
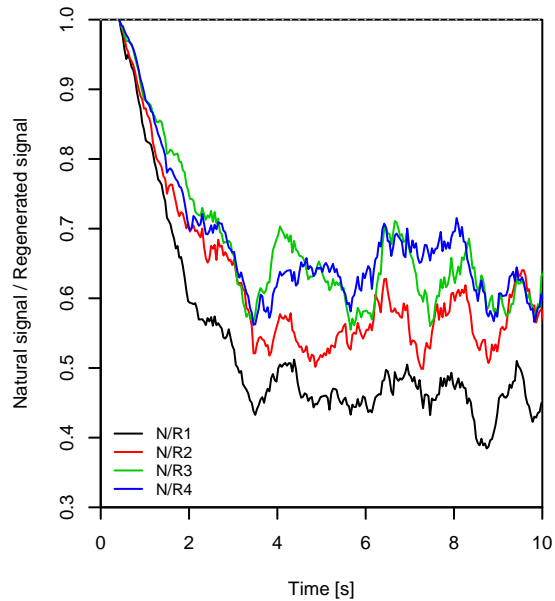
help("plot_NRt")

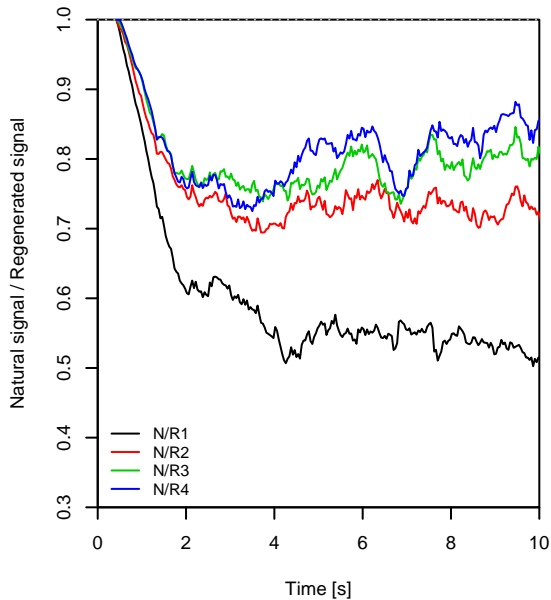
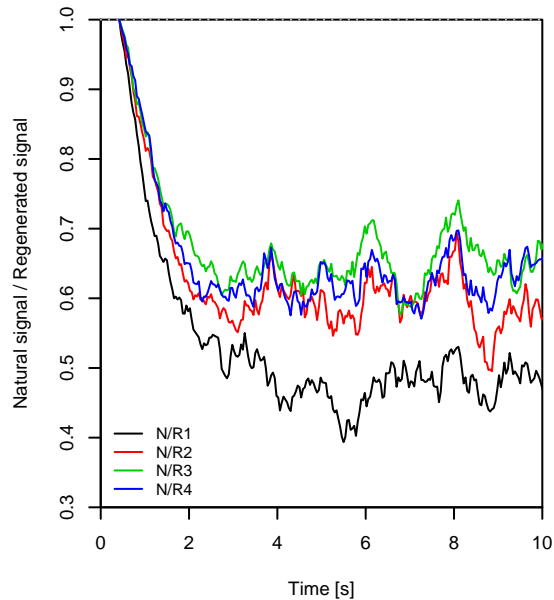
Aliquot #11**Aliquot #12**

Aliquot #13**Aliquot #14****Aliquot #15****Aliquot #16**

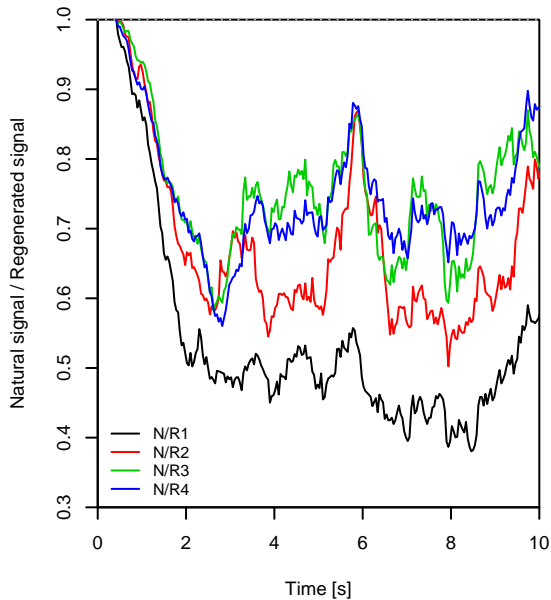
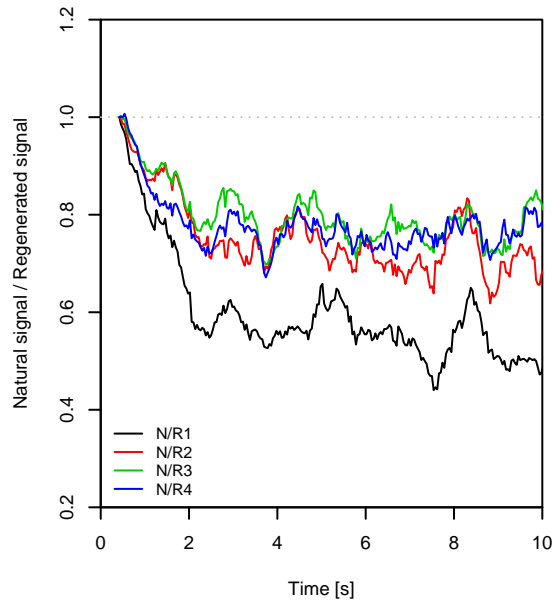
Aliquot #17**Aliquot #18**

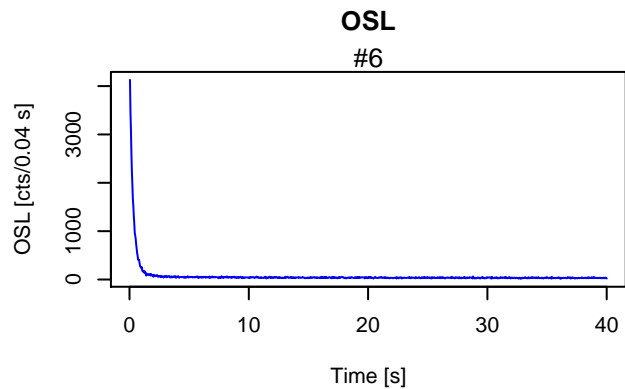
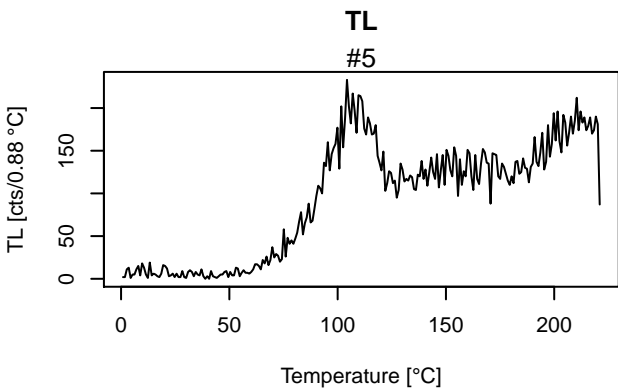
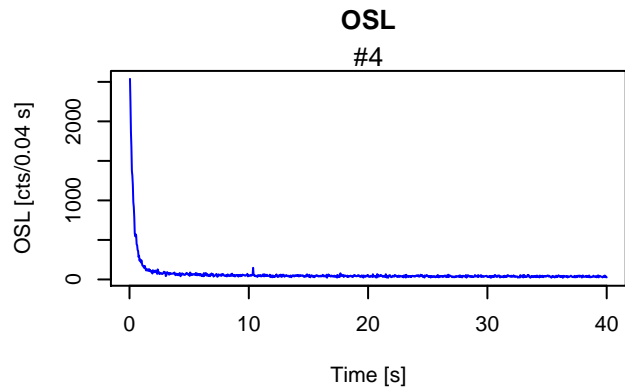
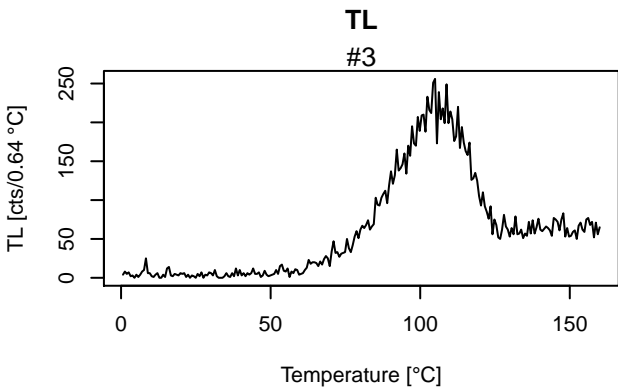
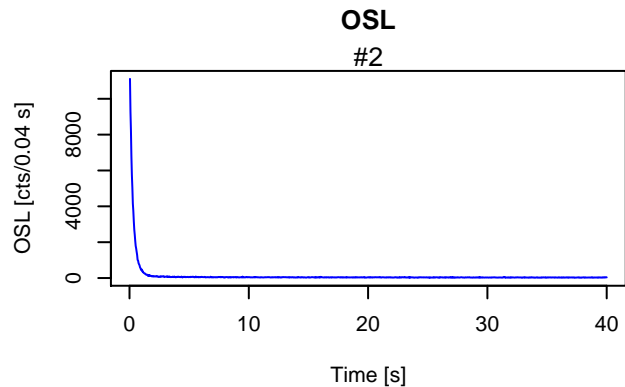
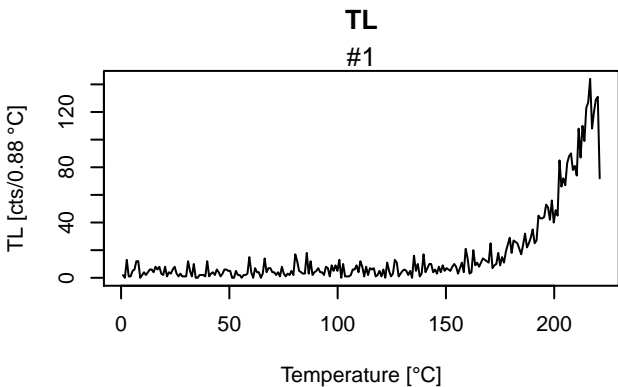
help("plot_NRt")

Aliquot #19**Aliquot #20**

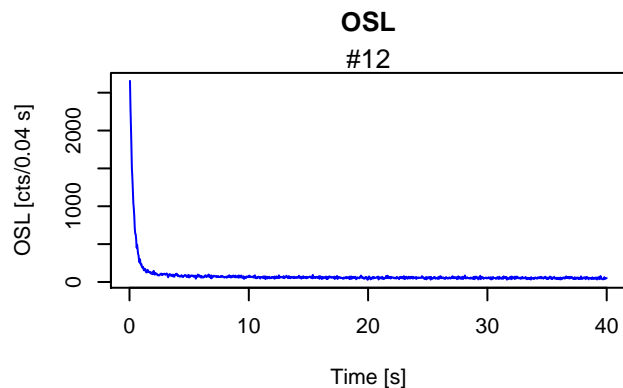
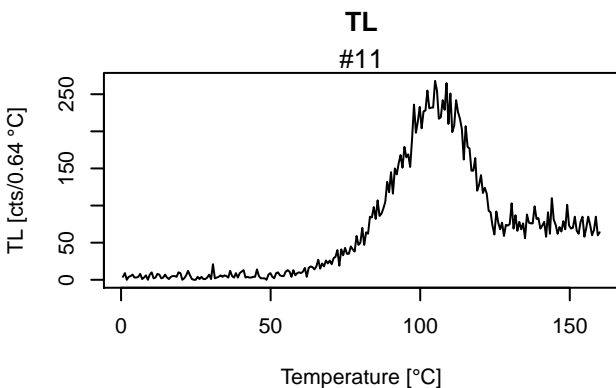
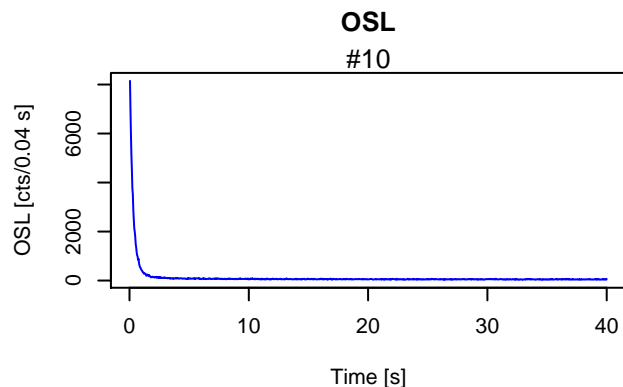
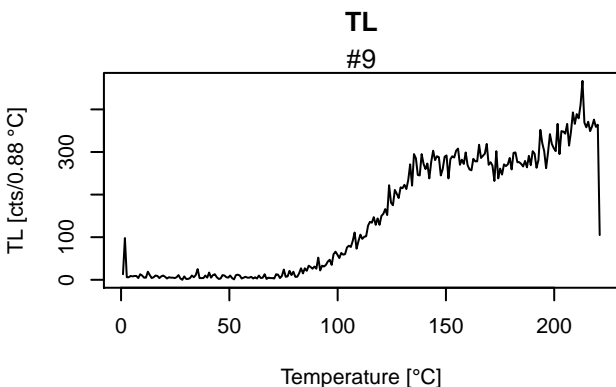
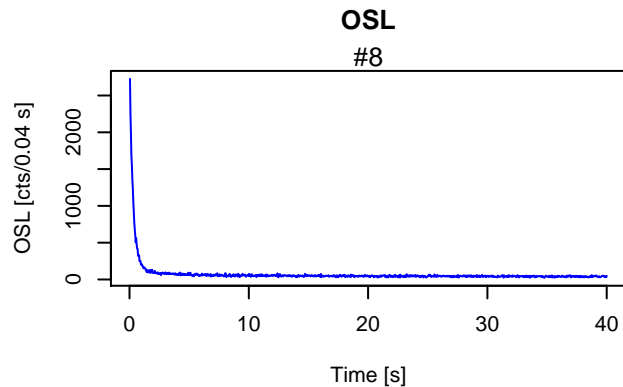
Aliquot #21**Aliquot #22**

[help\("plot_NRt"\)](#)

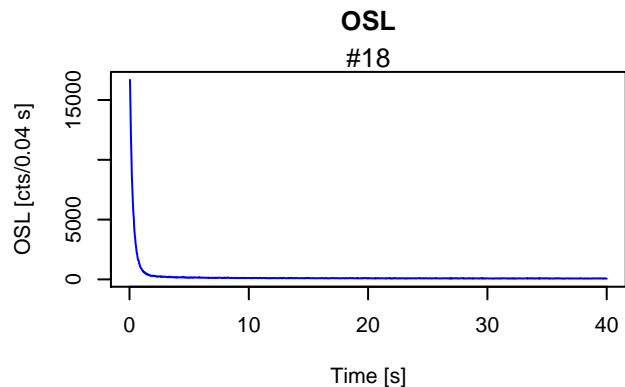
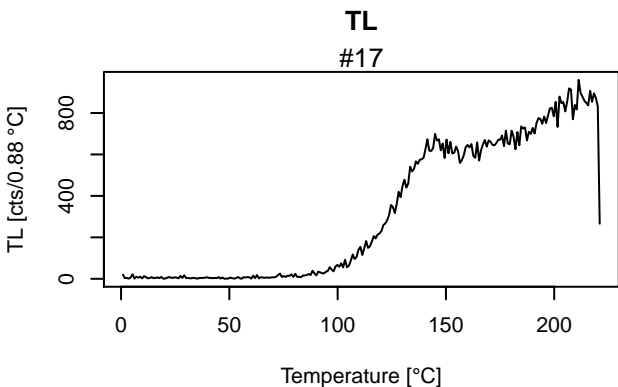
Aliquot #23**Aliquot #24**

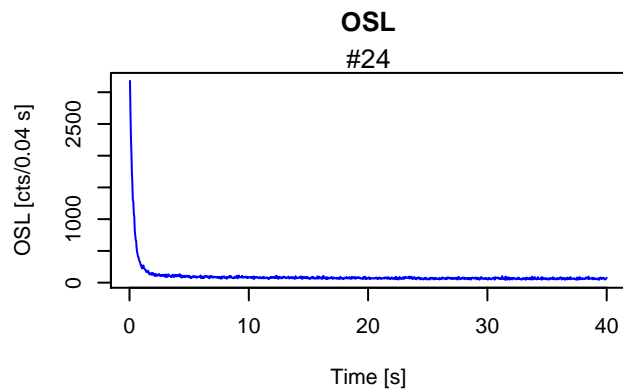
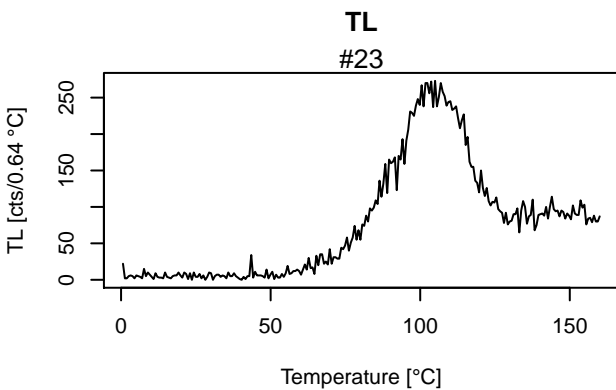
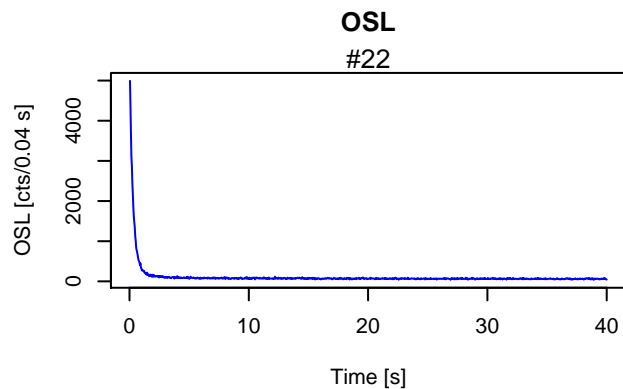
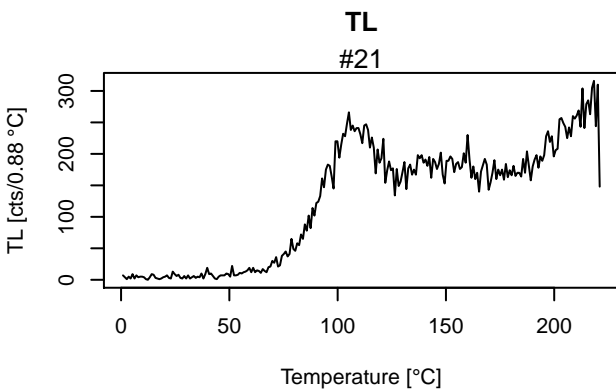


help("plot_RLumAnalysis")



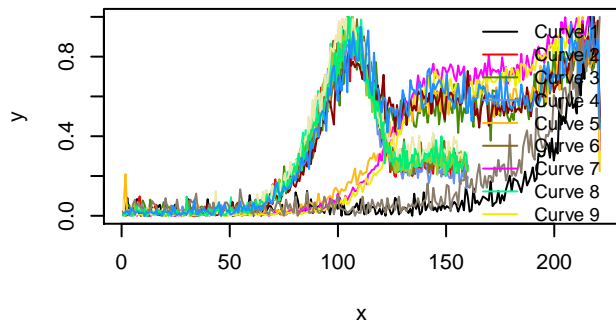
help("plot_RLumAnalysis")







TL combined



unkown curve type



RLum.Data.Image

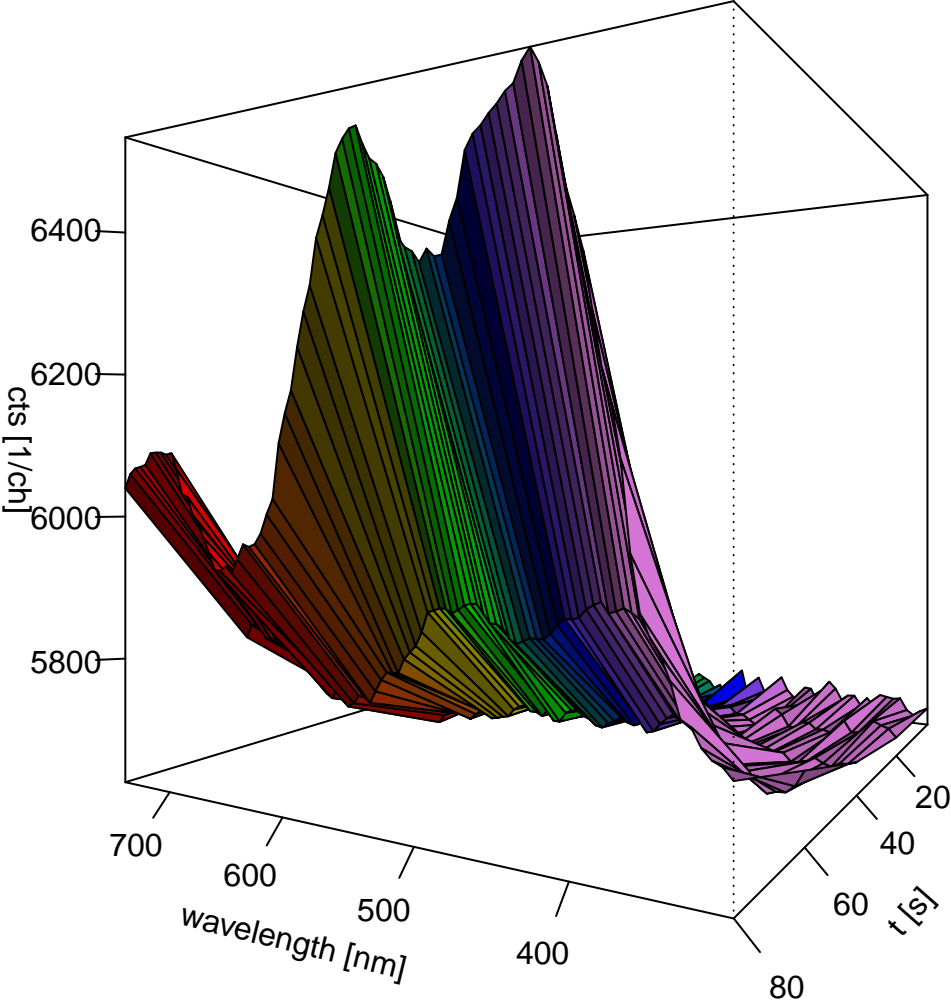


RLum.Data.Spectrum



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

RLum.Data.Spectrum

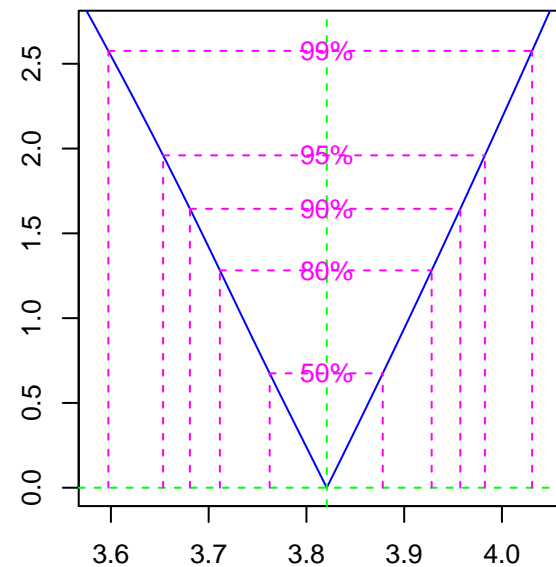


`help("plot_RLum.Data.Spectrum")`

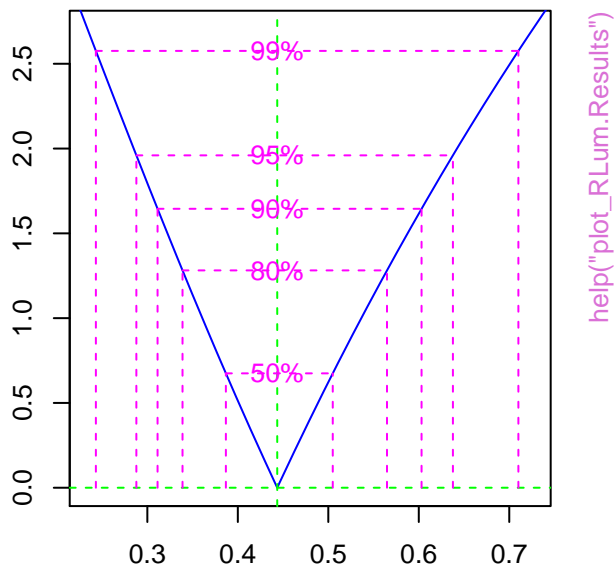
unkown curve type



Likelihood profile: gamma



Likelihood profile: sigma



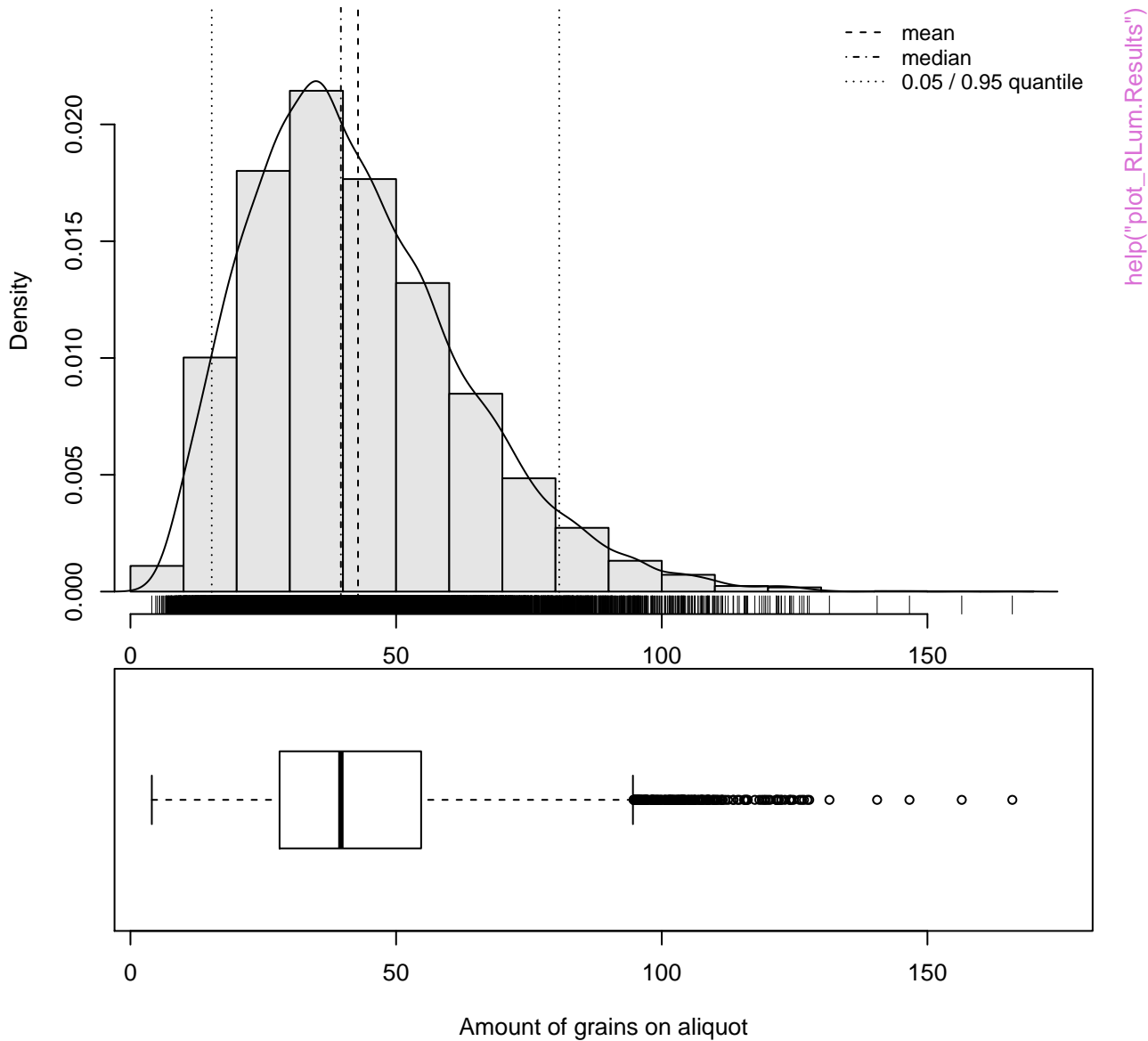
help("plot_RLum.Results")

Likelihood profile: p0



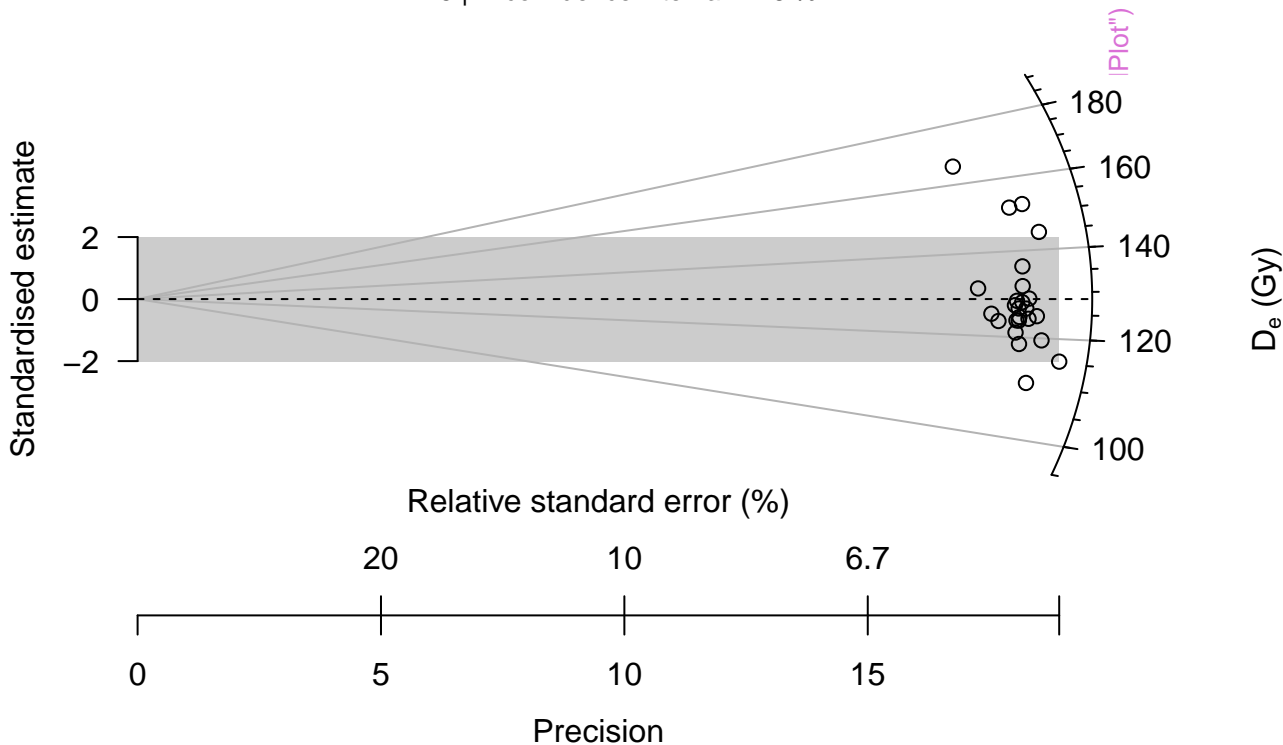
Monte Carlo Simulation

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



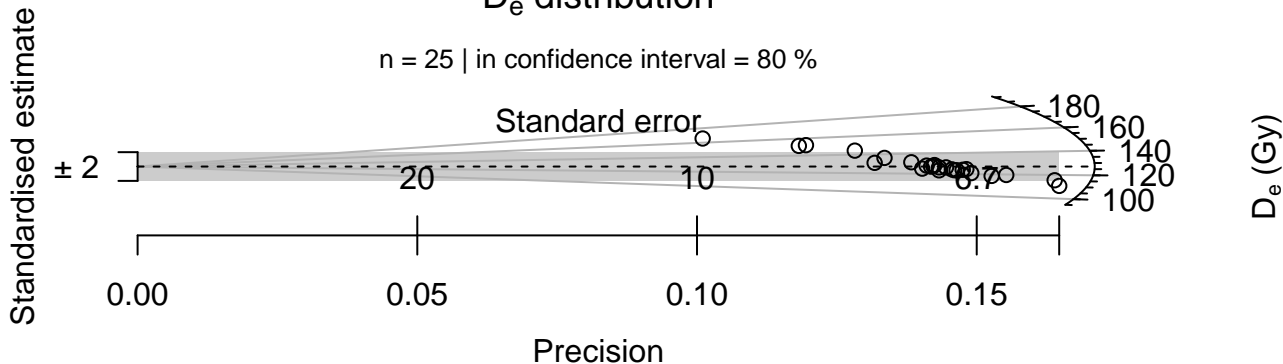
D_e distribution

n = 25 | in confidence interval = 76 %



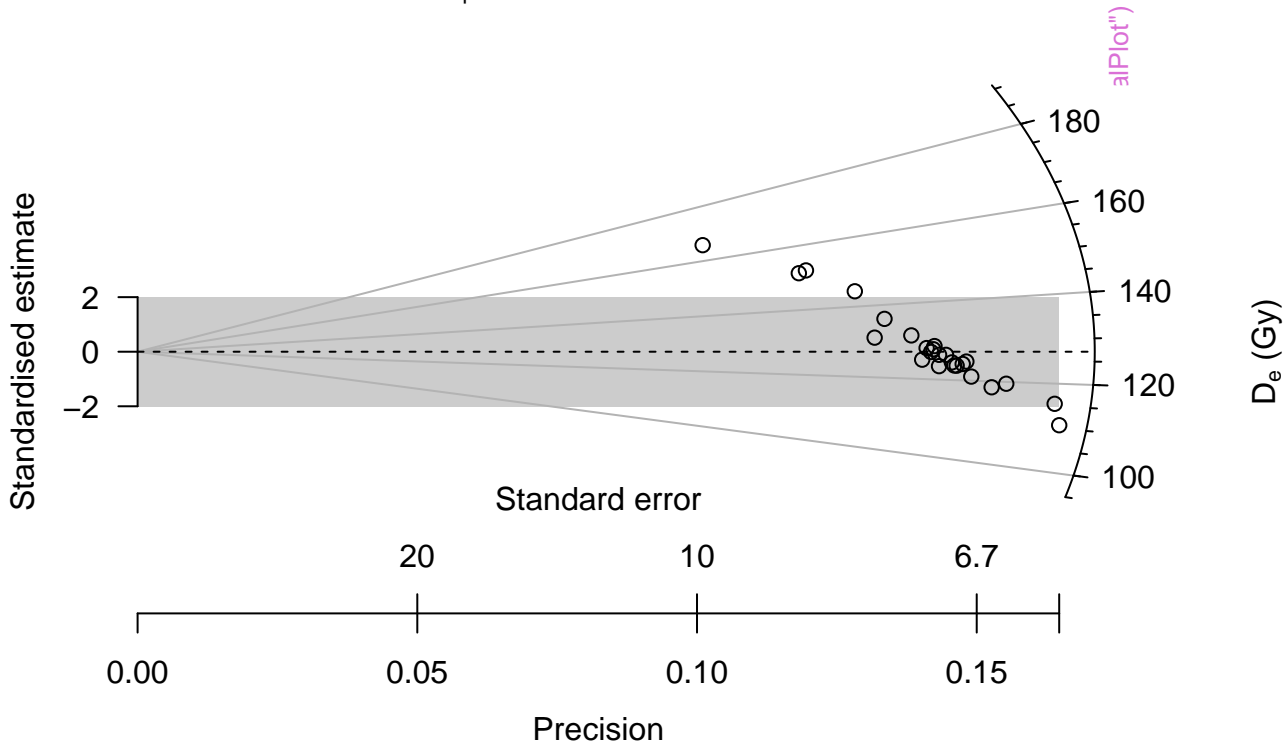
D_e distribution

n = 25 | in confidence interval = 80 %



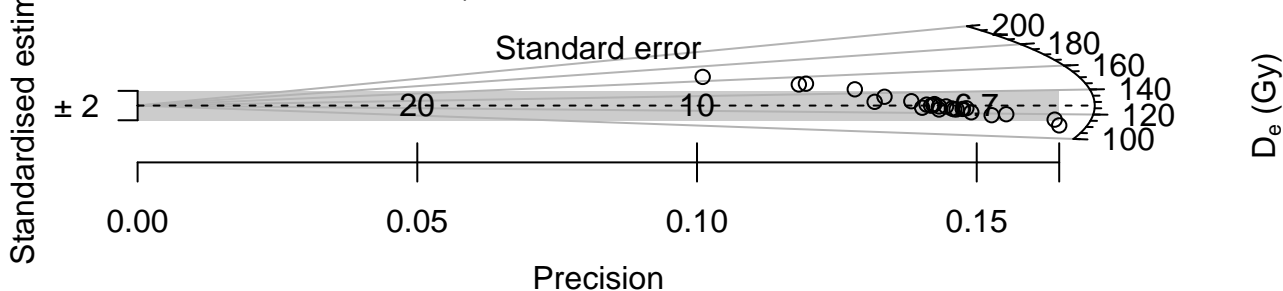
D_e distribution

n = 25 | in confidence interval = 80 %



D_e distribution

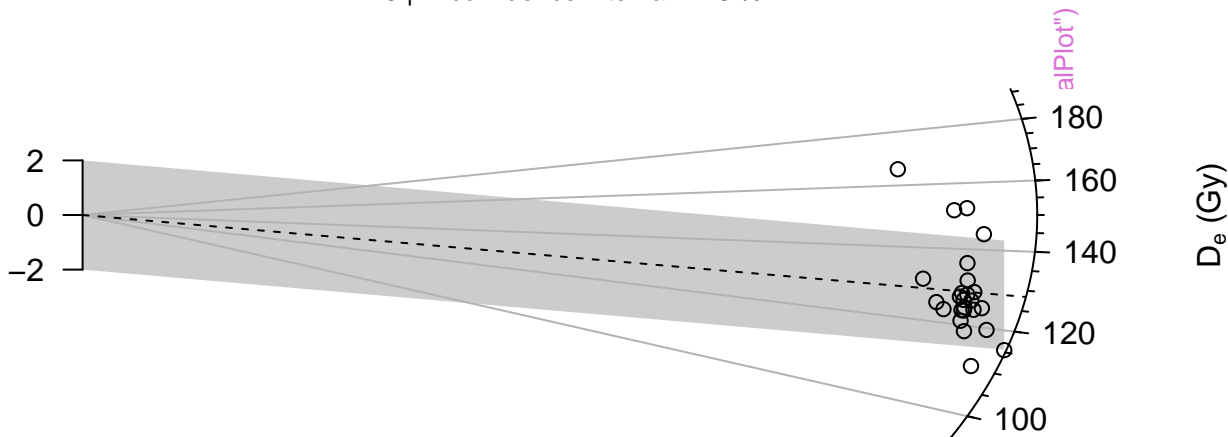
n = 25 | in confidence interval = 80 %



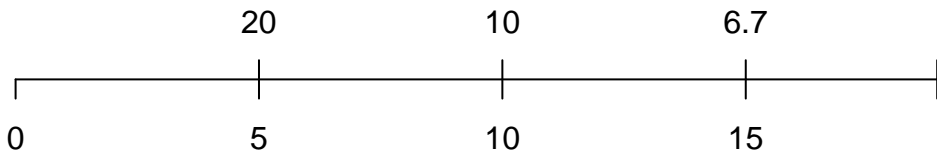
D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate



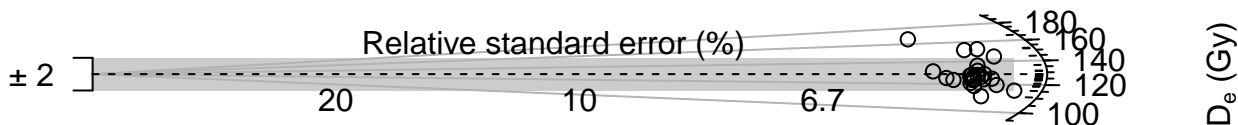
Relative standard error (%)



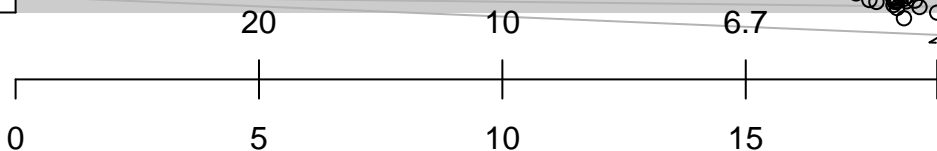
D_e distribution

n = 25 | in confidence interval = 76 %

Standardised estimate

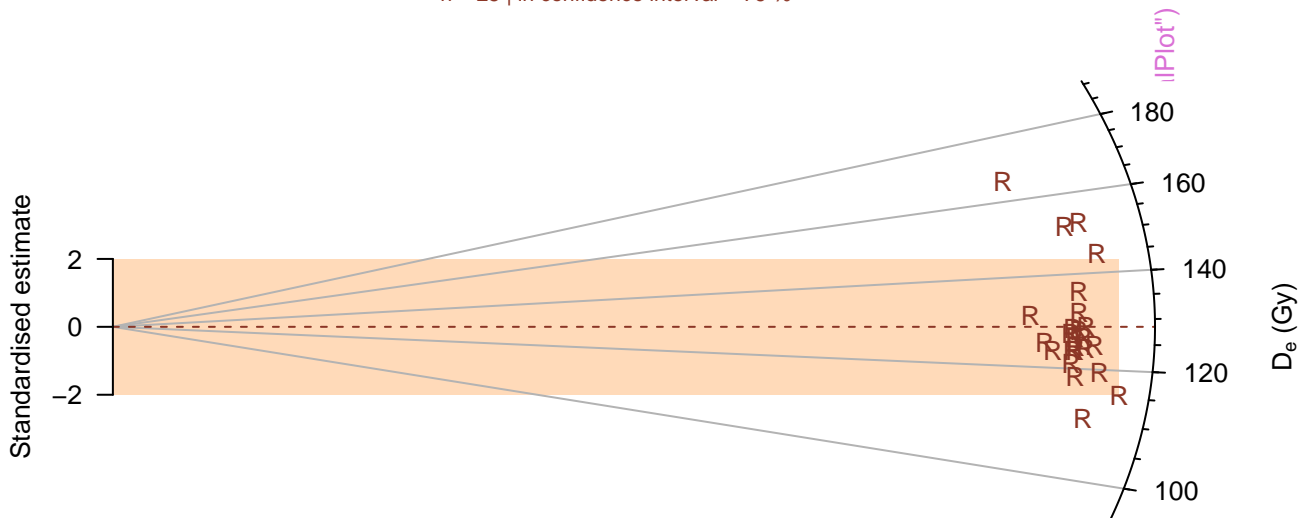


Relative standard error (%)

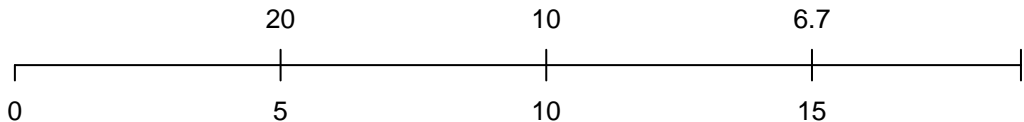


D_e distribution

n = 25 | in confidence interval = 76 %



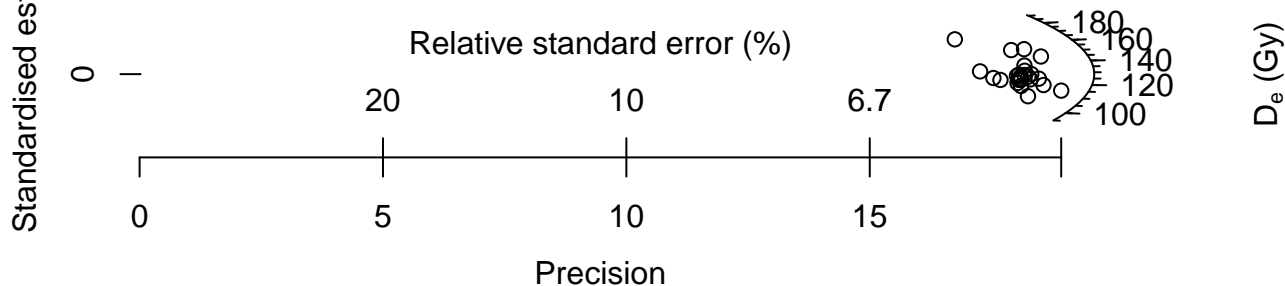
Relative standard error (%)



Precision

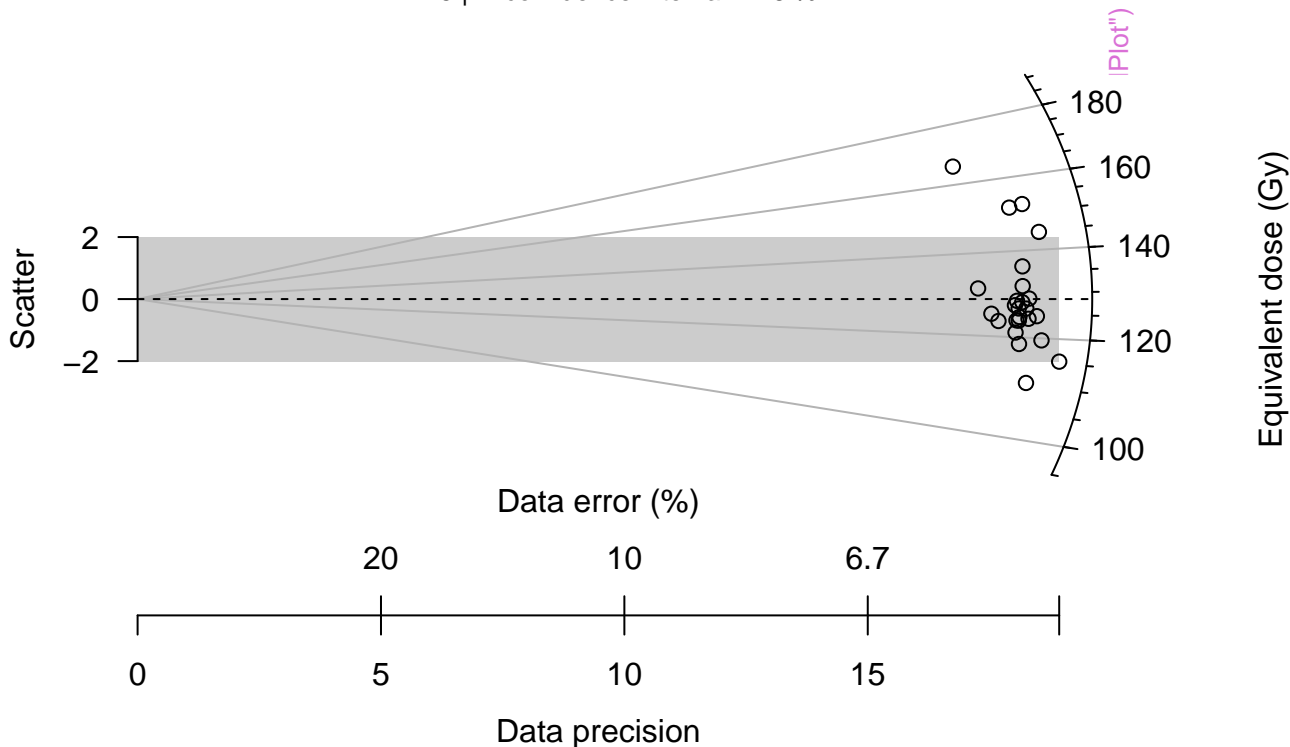
D_e distribution

n = 25 | in confidence interval = 76 %



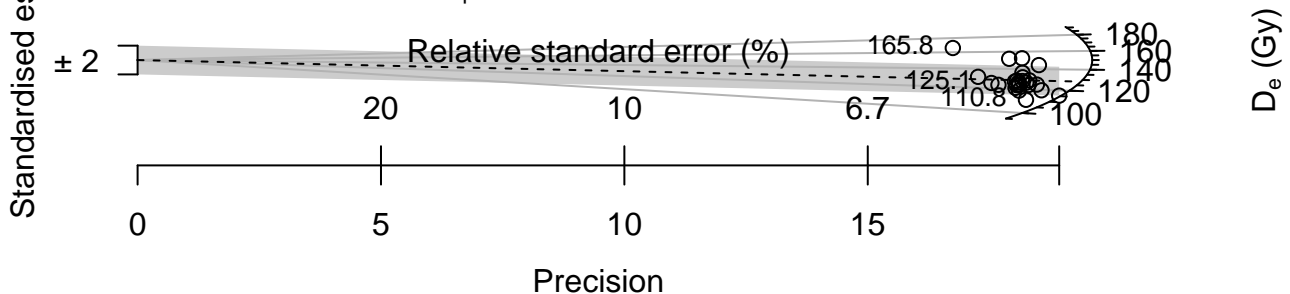
D_e distribution

n = 25 | in confidence interval = 76 %



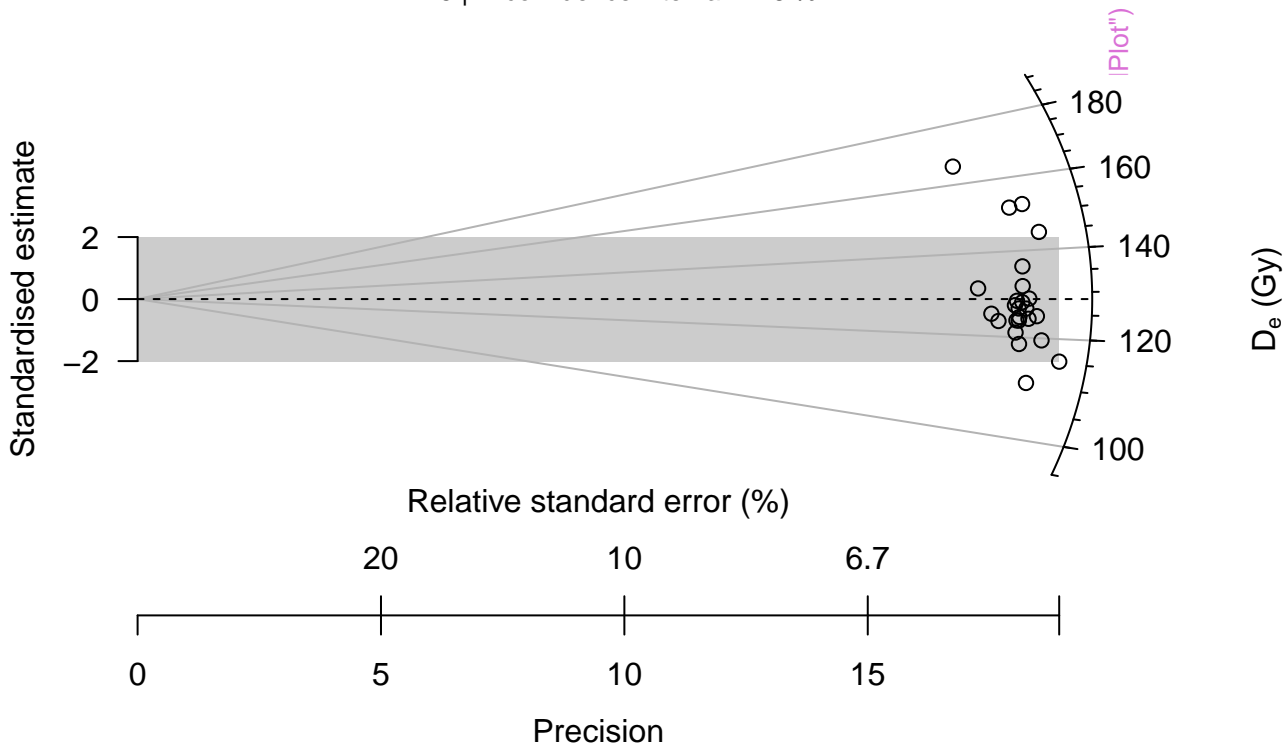
D_e distribution

n = 25 | in confidence interval = 76 %



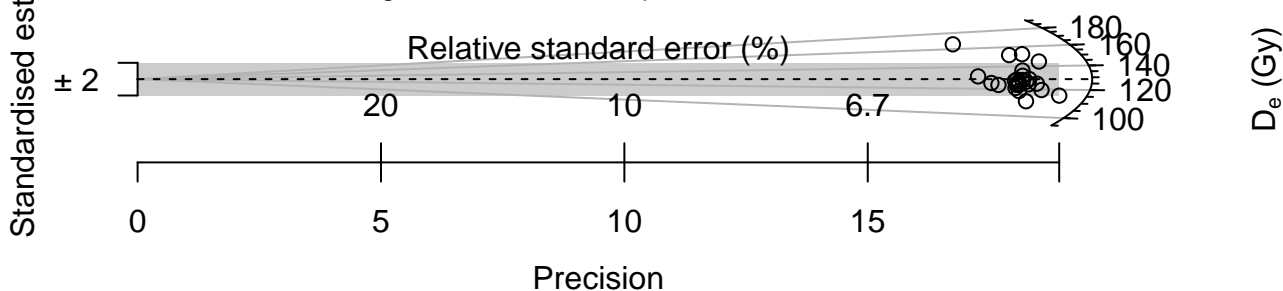
D_e distribution

n = 25 | in confidence interval = 76 %



D_e distribution

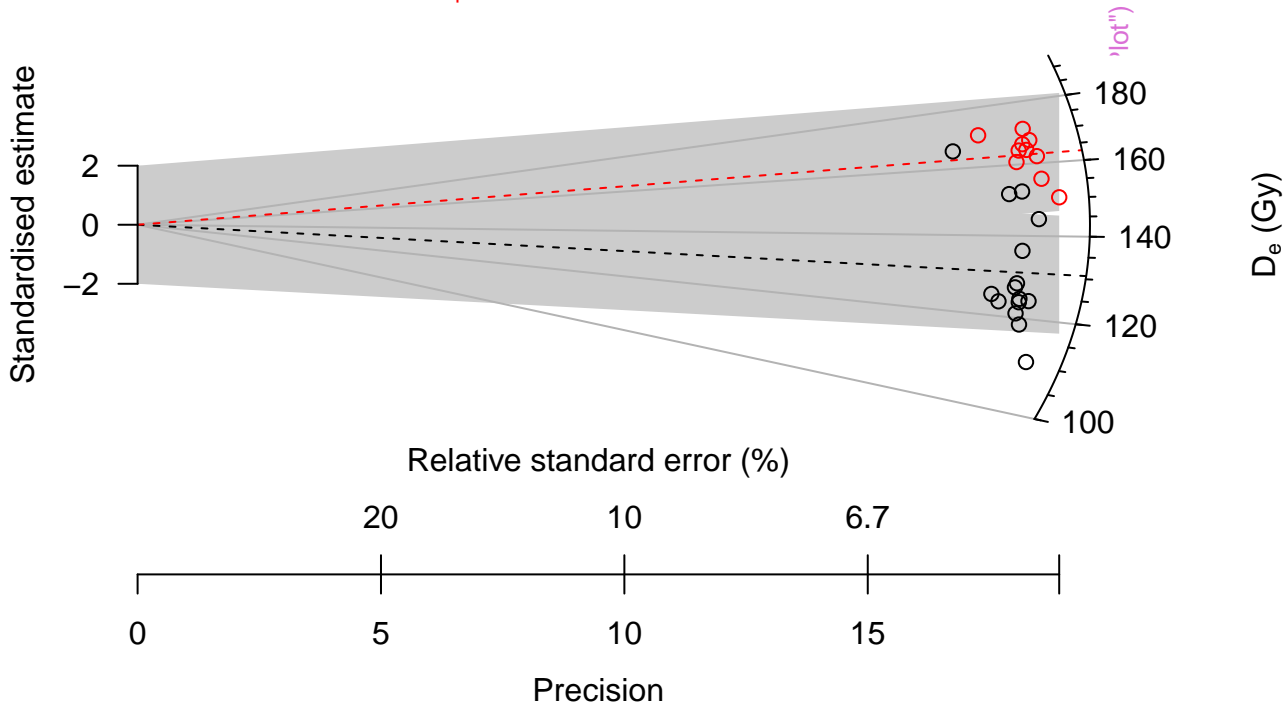
weighted mean = 128.12 | median = 126.34



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 %

