





Fig. 4 – Bos & Wallinga (2012)





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Fig. 4 – Bos & Wallinga (2012)





Fig. 4 – Bos & Wallinga (2012)







Histogram



Histogram



No L_x curves detected

No T_x curves detected



Density: g-values (%/decade)



Growth curve

 $D_e = 977.38 \pm 105.65$ | fit: EXP







LxTxData\$Dose







RLum.Data.Image







Depth (mm)

help("ExampleData.SurfaceExposure")

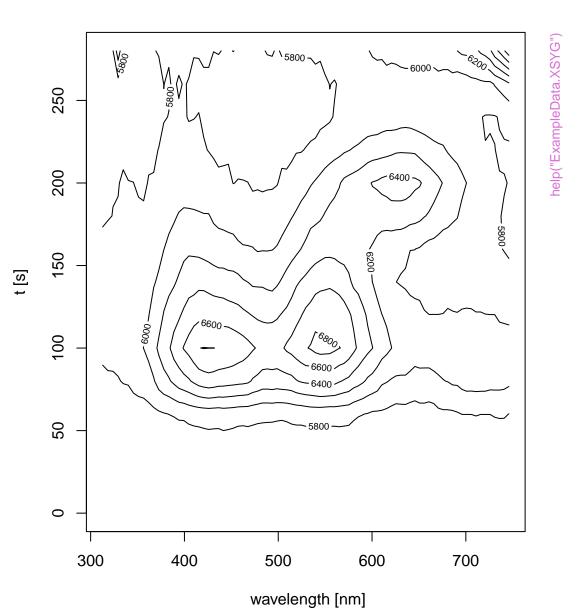
Depth (mm)

help("ExampleData.SurfaceExposure")

OSL (UVVIS)



RLum.Data.Spectrum





























































Irradiation Time Correction

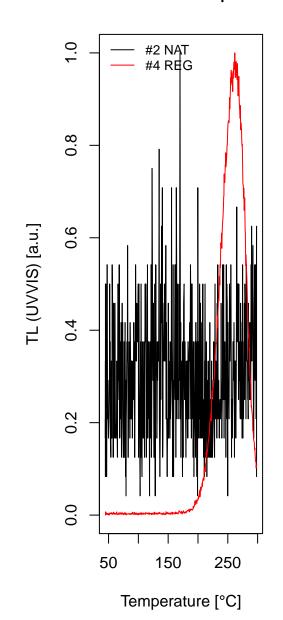


ALQ POS: 1 | OSL DE: 0 ± 0 1.0 #1 NAT #3 REG #5 BG 0.9 0.8 OSL (UVVIS) [a.u.] 0.7 9.0 0.5 42 46 50

Simulation [s]

ALQ POS: 1 | T#1

help("analyse_Al2O3C_Measurement")



ALQ POS: 2 | OSL

DE: 0 ± 0 1.0 #1 NAT #3 REG #5 BG 0.9 0.8 0.7 9.0

42

46

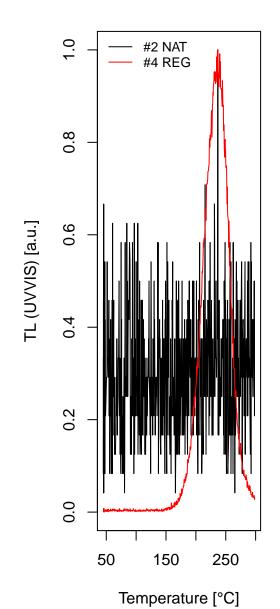
Simulation [s]

50

OSL (UVVIS) [a.u.]

ALQ POS: 2 | T#2

help("analyse_Al2O3C_Measurement")



No L_x curves detected

No $T_{\boldsymbol{x}}$ curves detected



Density: g-values (%/decade)



IR-RF $D_e = 623.25 [600.63; 635.8]$ RF_nat + RF_reg 2.0e+03 IR-RF [cts/1.3 s] 1.8e + 031.6e + 031.4e+03Ш 100 200 300 400 500 600 700 0

Time [s]

IR-RF $D_e = 610.17 [567.19; 653.15]$ RF_nat + RF_reg 2.0e+03 IR-RF [cts/1.3 s] 1.6e + 031.4e+03Ш 610.17 600 0 100 200 300 400 500 700 Time [s]



Growth curve

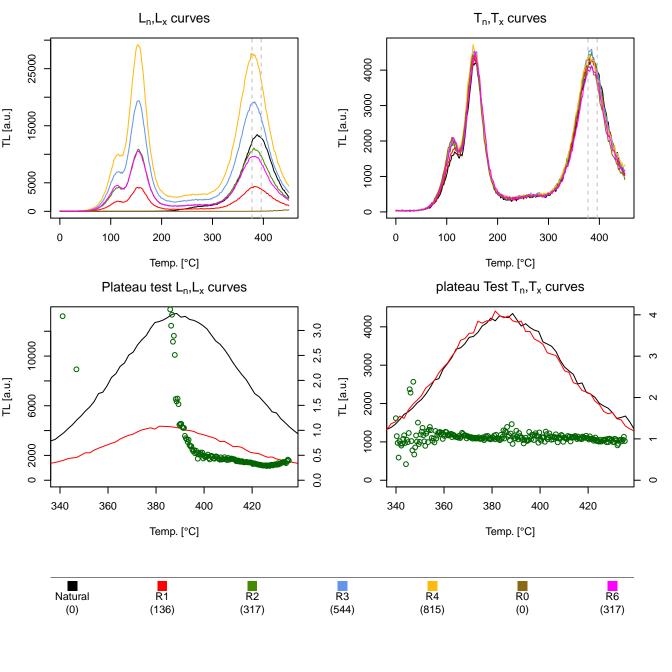
 $D_e = 1668.25 \pm 49.22$ | fit: EXP



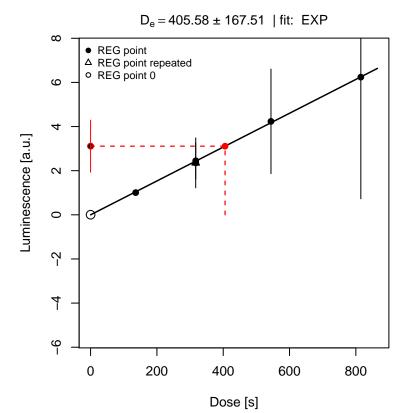


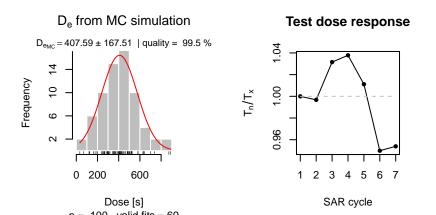






Growth curve





TL pseudoIRSL1 pseudoIRSL2



T [°C]

help("analyse_pIRIRSequence")





T [°C]





D_e from MC simulation



Test dose response







 $D_e = 1668.25 \pm 47.59$ | fit: EXP



$\ensuremath{D_{e}}$ from MC simulation





Summarised Dose Response Curves



Sensitivity change



Rejection criteria



USER combined



IRSL combined



OSL combined





OSL



OSL



OSL



Monte Carlo Simulation

$$n = |\hat{\mu} = 43|\hat{\sigma} = 20|\frac{\hat{\sigma}}{\sqrt{n}} = 2|v = 0.73$$





D_e distribution





Standardised estimate



Profile log likelihood for σ_{OD}



Fast Ratio







Fuchs & Lang (2001)



No L_x curves detected

No T_x curves detected

Signal Fading g-value: 5.18 ± 0.67 (%/decade) | tc = 3.78e+02 1.0 Normalised intensity [a.u.] 0.8 9.0 0.4 0.2 fit MC fit 4e+02 4e+03 4e+04 4e+05 Time since irradition [s]

Density: g-values (%/decade)



Measured dose response curve

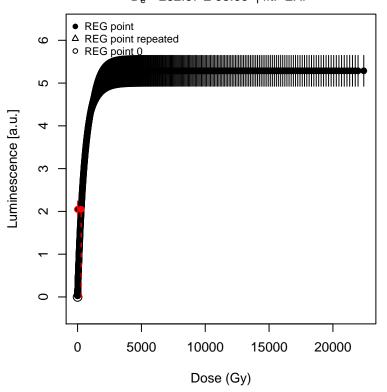
 $D_e = 130.97 \pm 17.12$ | fit: EXP





Simulated dose response curve

 $D_e = 282.67 \pm 38.63$ | fit: EXP





Dose response curves







No L_x curves detected

No T_x curves detected



Density: g-values (%/decade)



Measured dose response curve

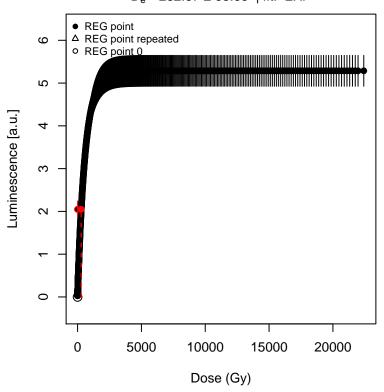
 $D_e = 130.97 \pm 17.12$ | fit: EXP

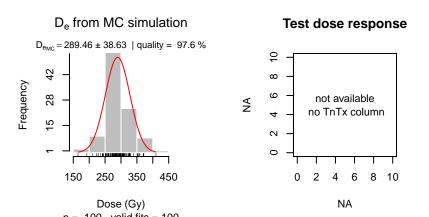




Simulated dose response curve

 $D_e = 282.67 \pm 38.63$ | fit: EXP



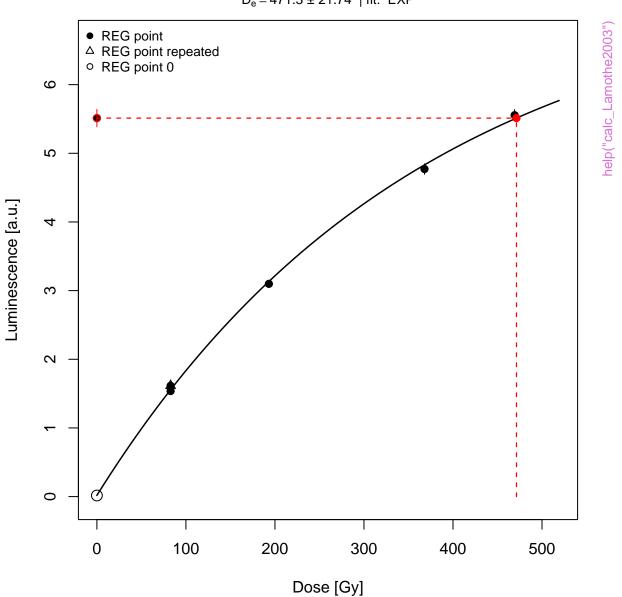


Dose response curves



Corrected Dose Response Curve

 $D_e = 471.3 \pm 21.74$ | fit: EXP



Likelihood profile: gamma



Likelihood profile: p0



Likelihood profile: sigma



Likelihood profile: gamma



Likelihood profile: p0



Likelihood profile: sigma



Source Dose Rate Prediction



help("calc_SourceDoseRate")

D_e distribution



Thermal Lifetime Contour Plot



Thermal Lifetime Density Plot

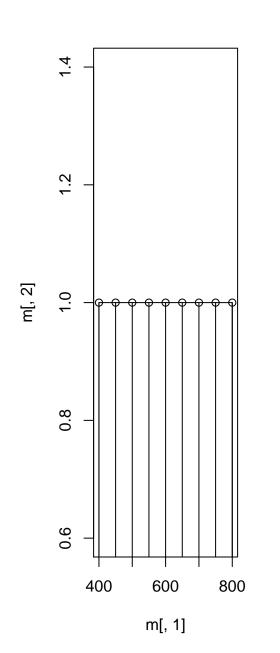


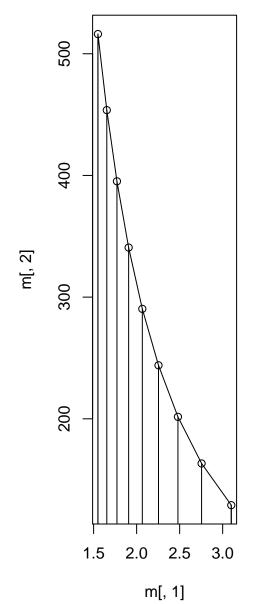


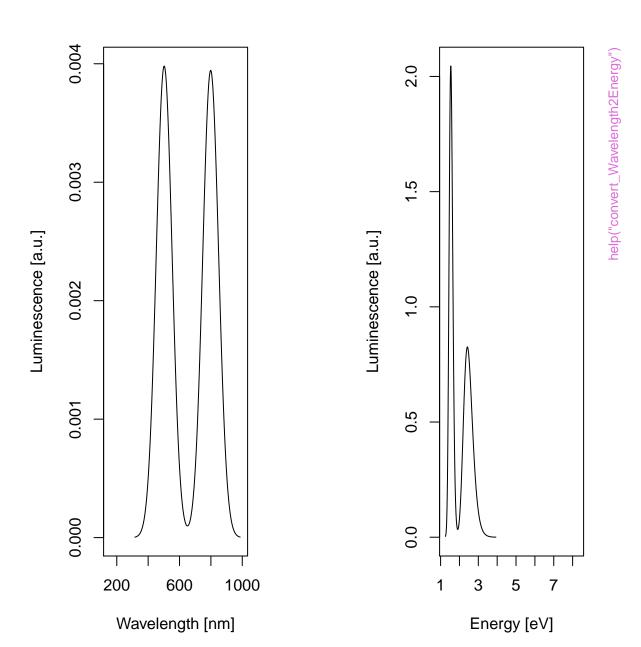


gSGC and resulting De









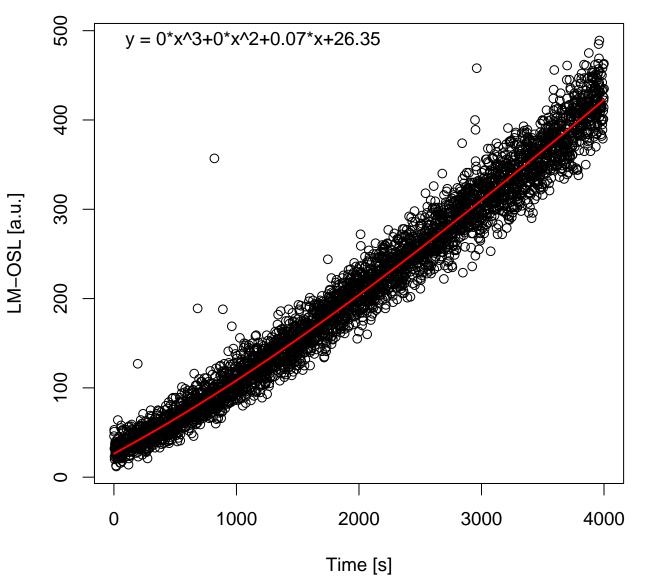








Background





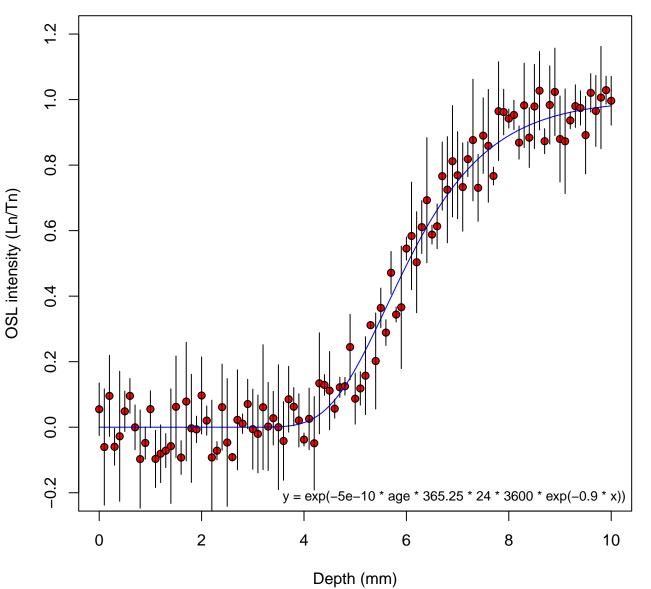


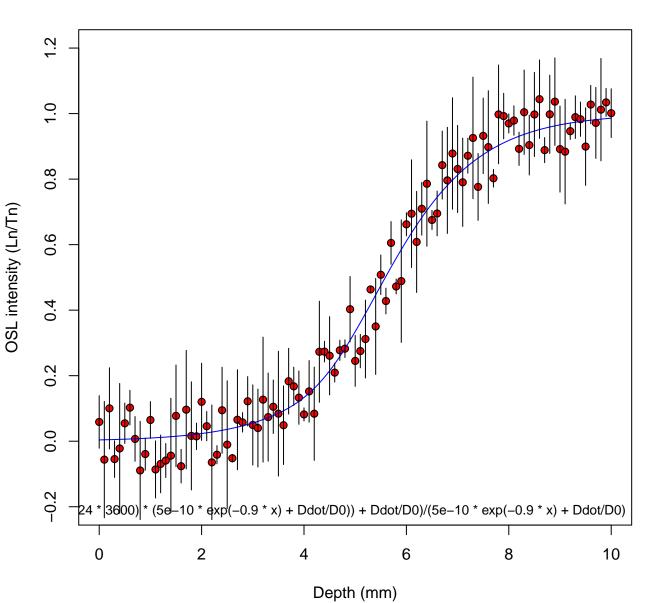


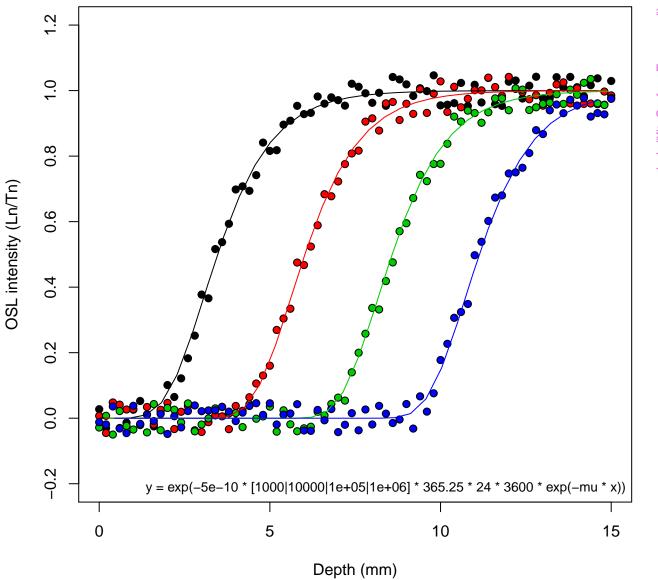


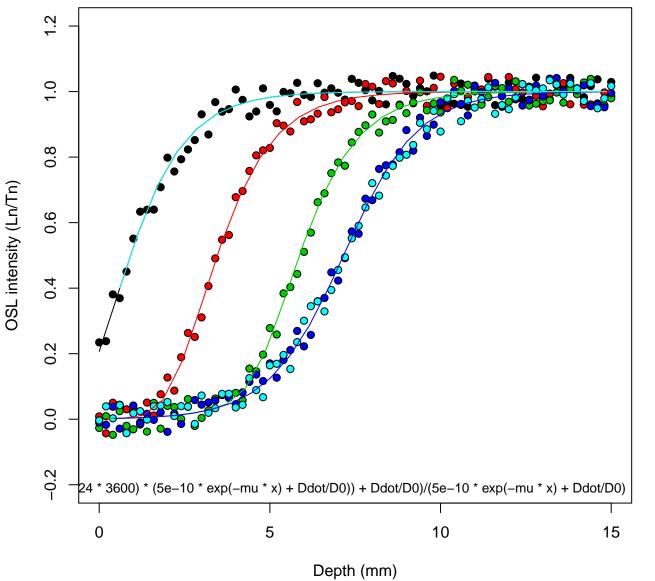




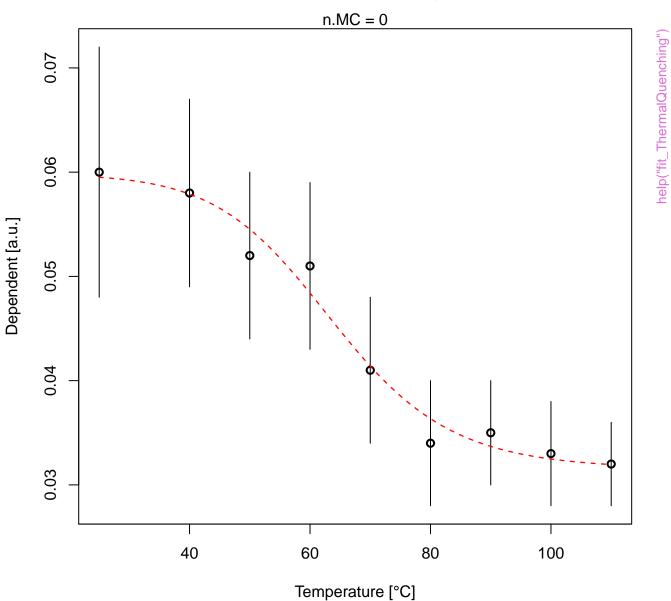






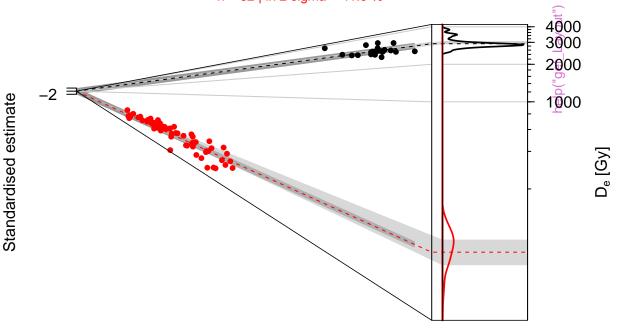


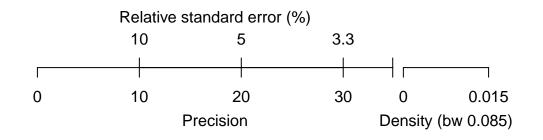
Thermal quenching



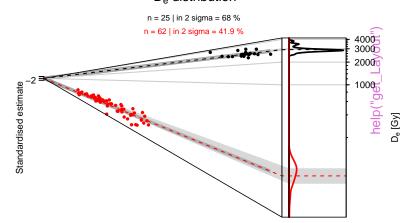
D_e distribution

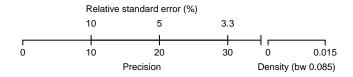
n = 25 | in 2 sigma = 68 % n = 62 | in 2 sigma = 41.9 %



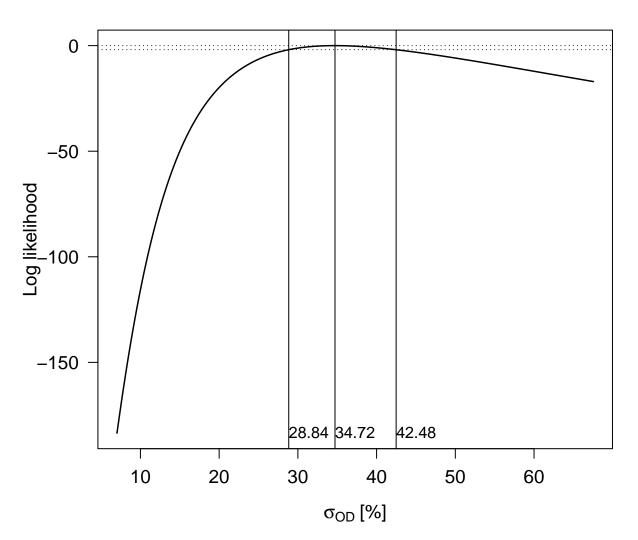


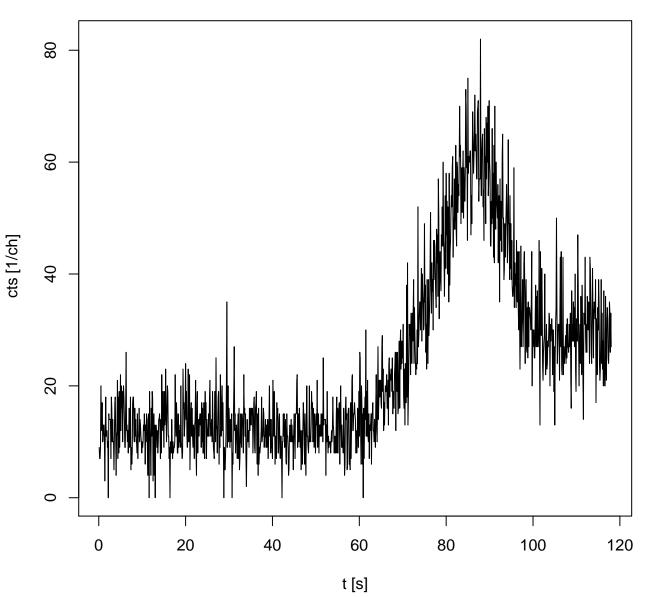
D_{e} distribution





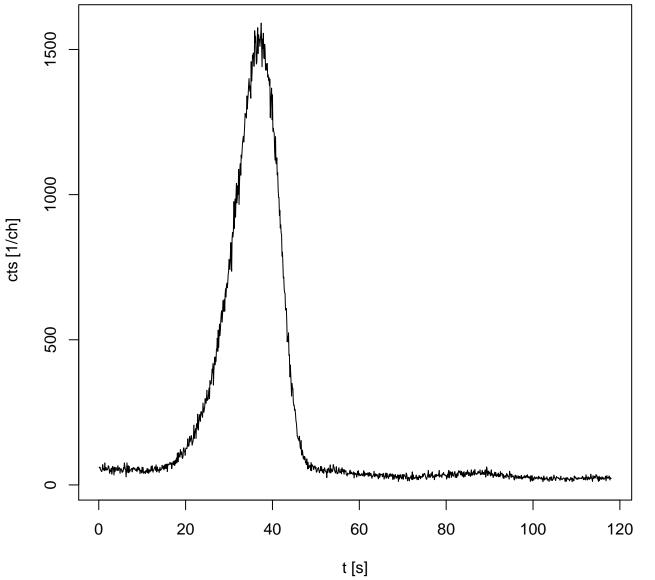
Profile log likelihood for σ_{OD}



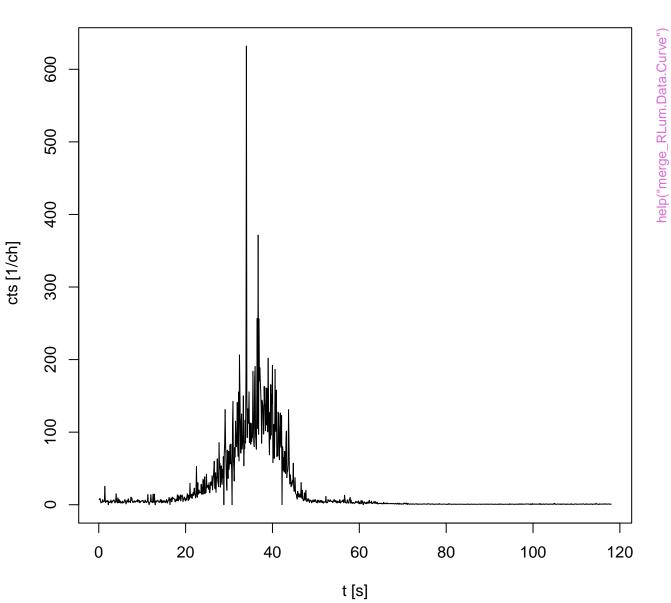


help("merge_RLum.Data.Curve")

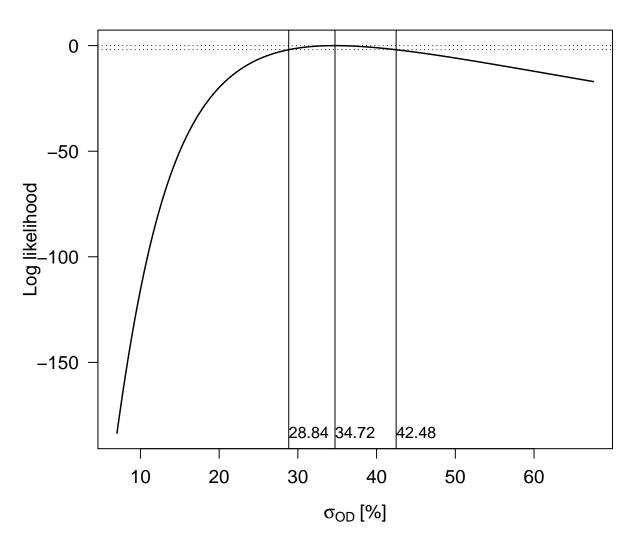
TL (UVVIS)



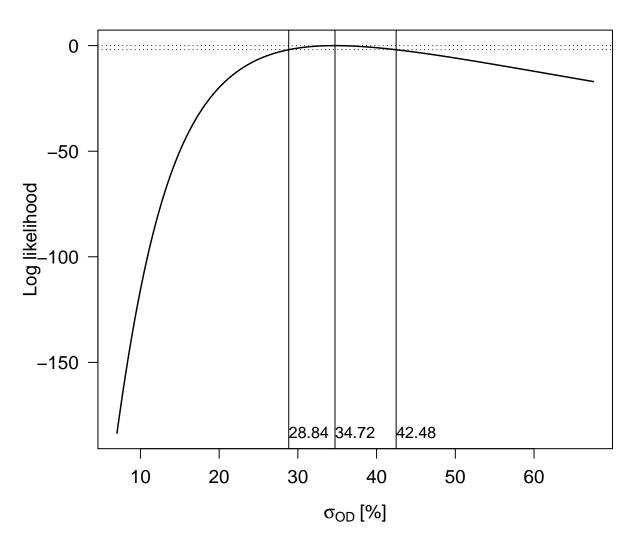
TL (UVVIS)



Profile log likelihood for σ_{OD}



Profile log likelihood for σ_{OD}



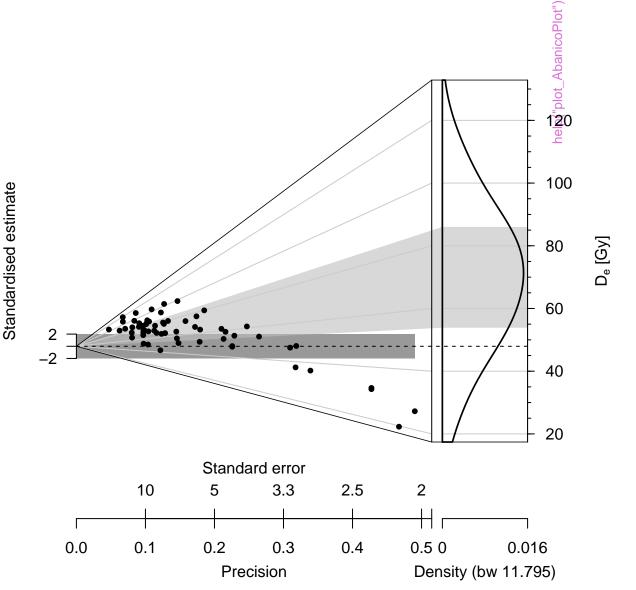






D_e distribution



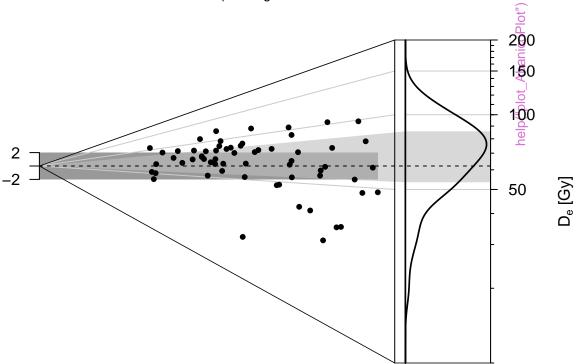


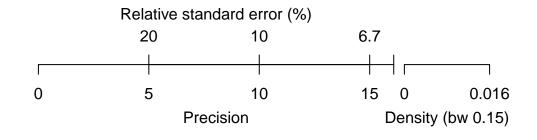






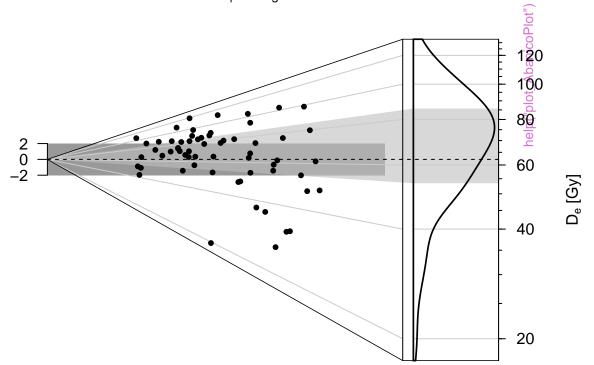


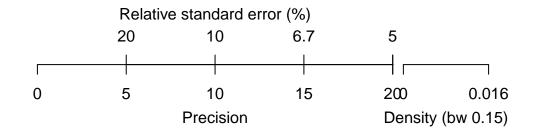




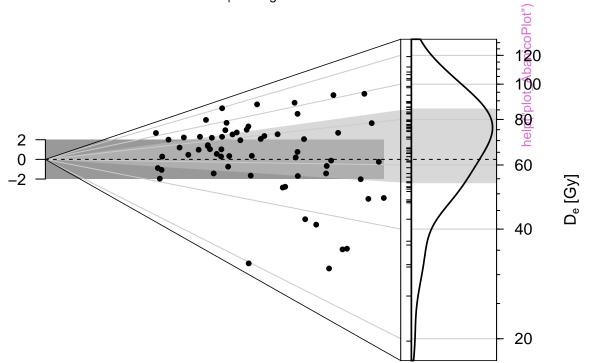
D_{e} distribution

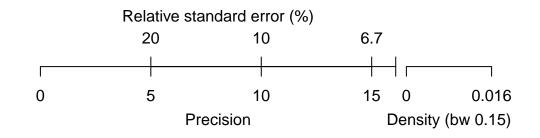
n = 62 | in 2 sigma = 41.9 %



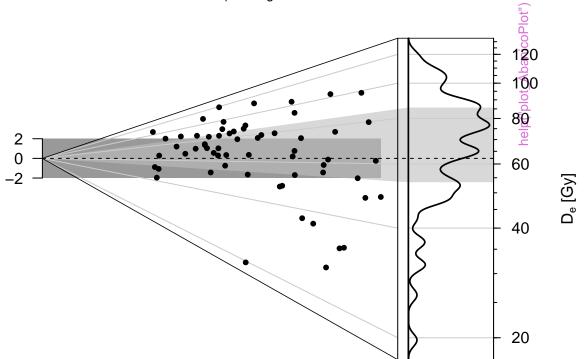


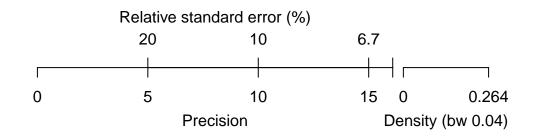






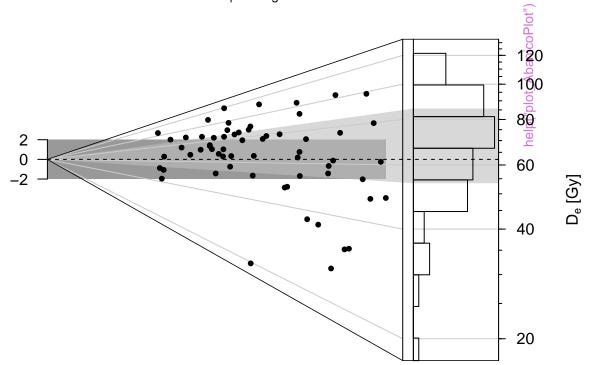






D_{e} distribution

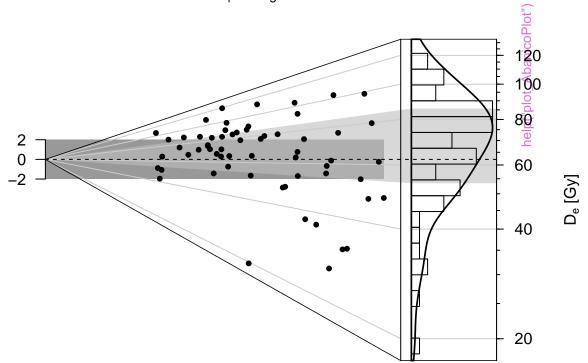
n = 62 | in 2 sigma = 41.9 %

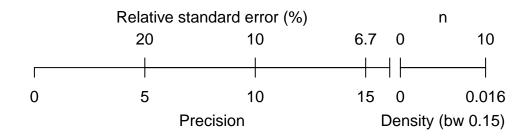




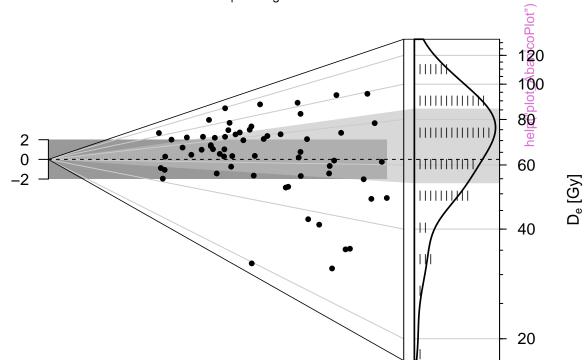
D_{e} distribution

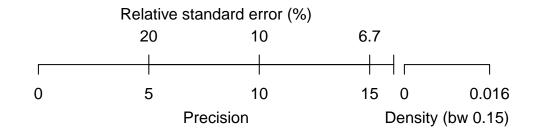
n = 62 | in 2 sigma = 41.9 %



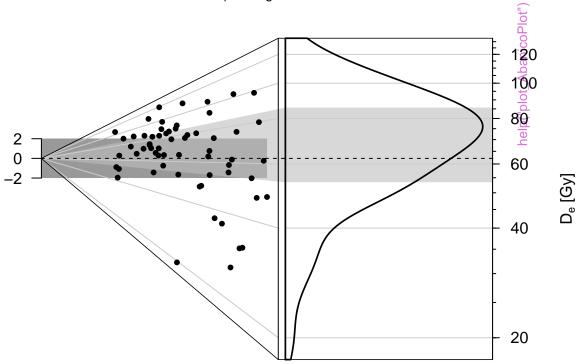


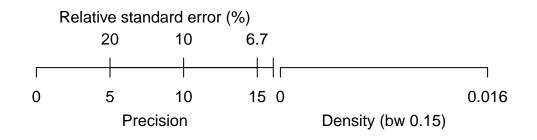
n = 62 | in 2 sigma = 41.9 %



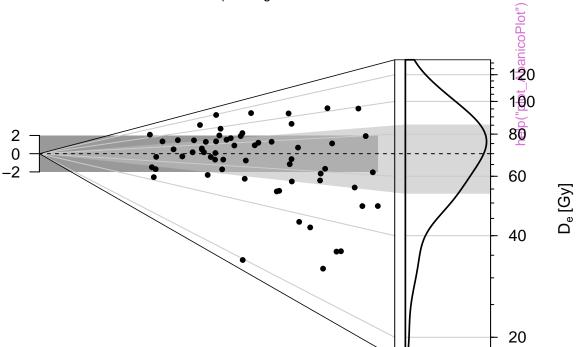






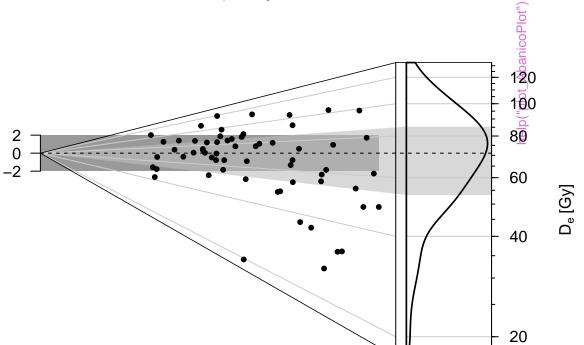






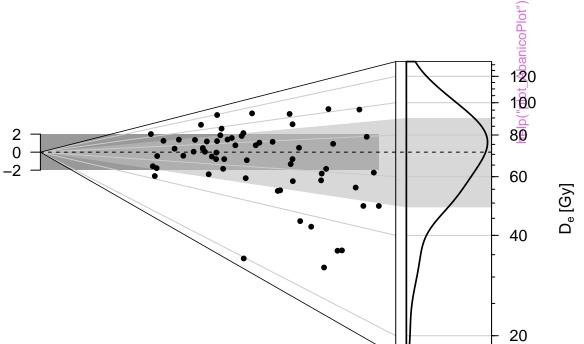






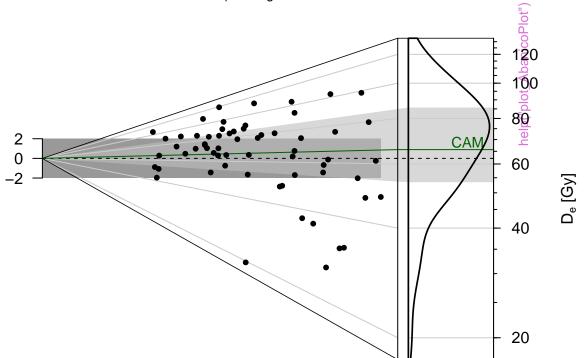


n = 62 | in 2 sigma = 54.8 %



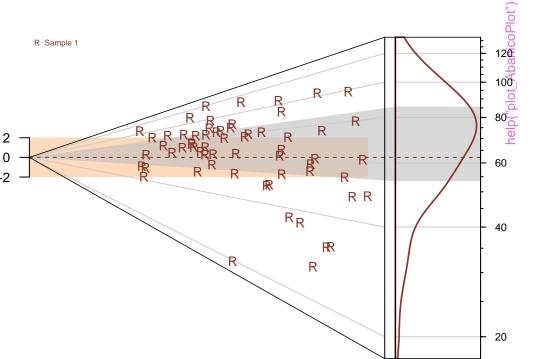


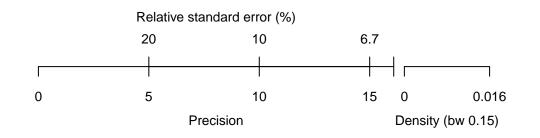








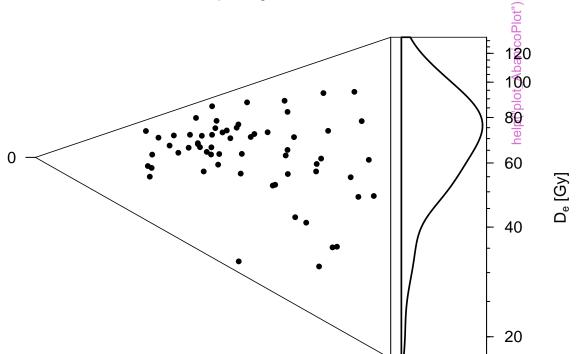






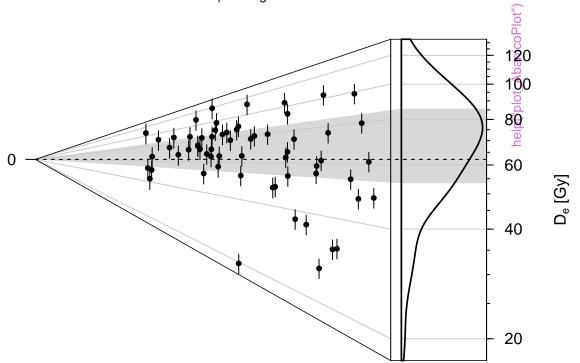
Standardised estimate

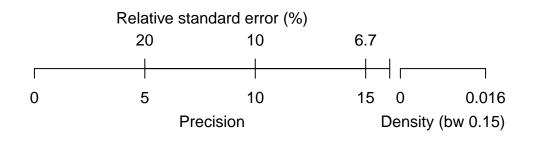
n = 62 | in 2 sigma = 41.9 %



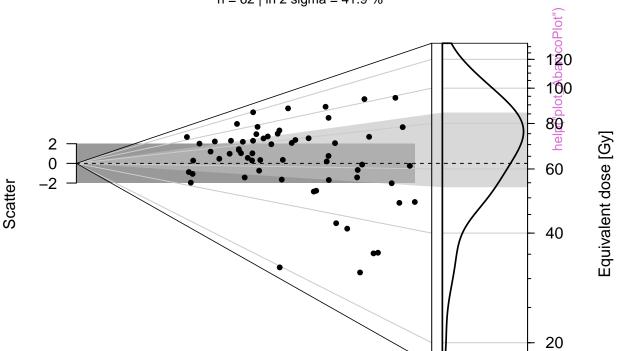


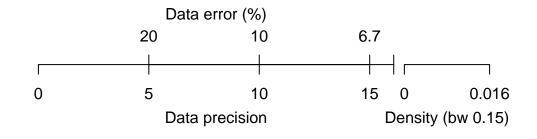
n = 62 | in 2 sigma = 41.9 %





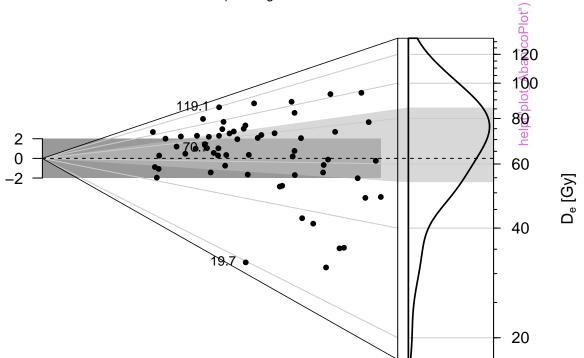












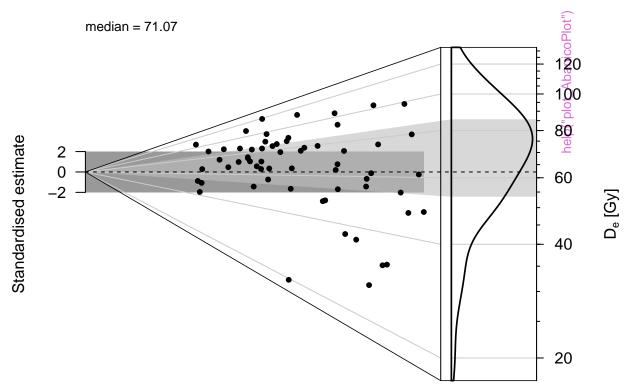


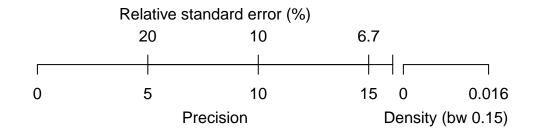


n = 62 | in 2 sigma = 41.9 %

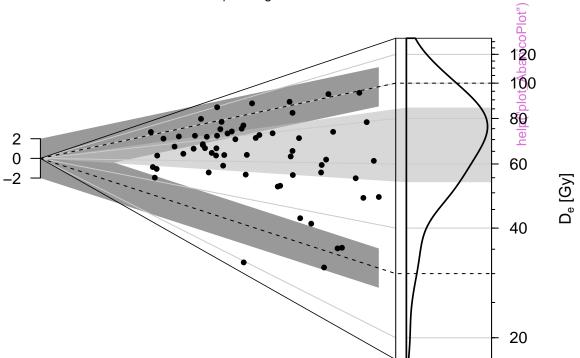






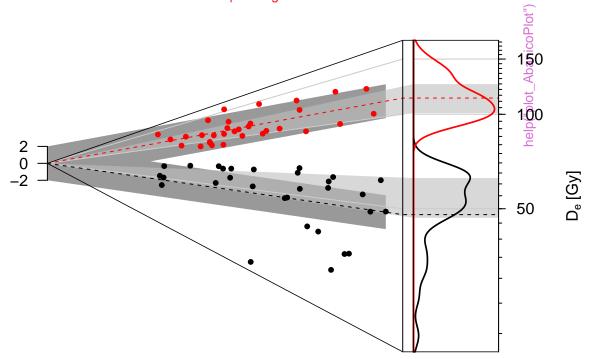


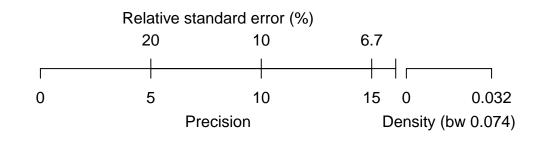






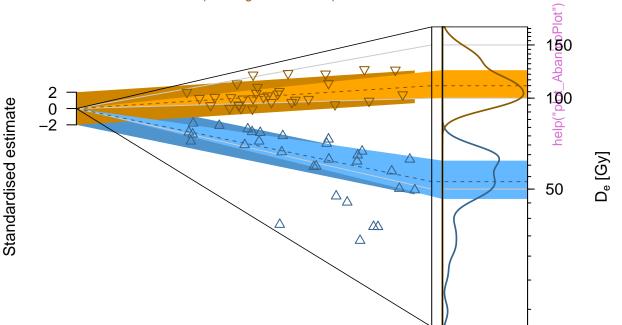


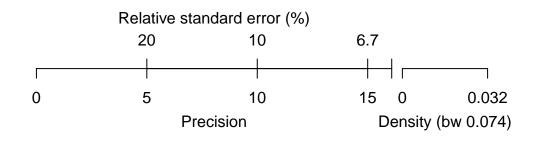


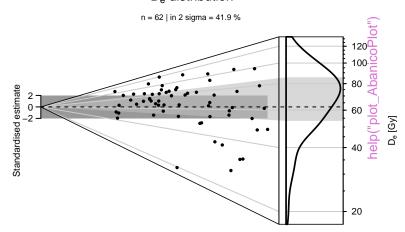


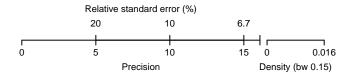
De distribution

n = 30 | in 2 sigma = 70 % | median = 52.94 n = 32 | in 2 sigma = 84.4 % | median = 109.93

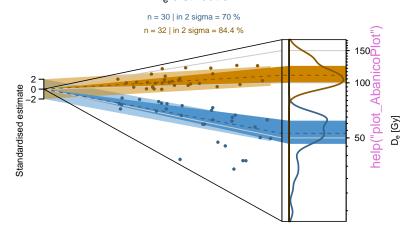






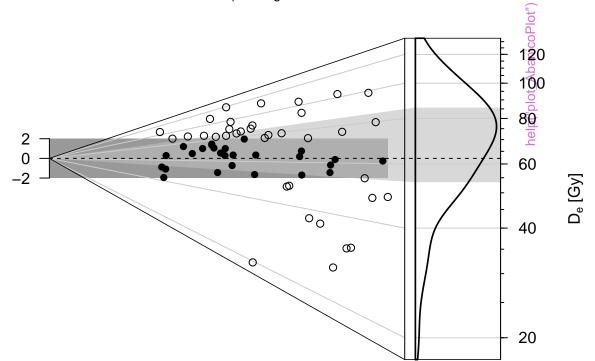


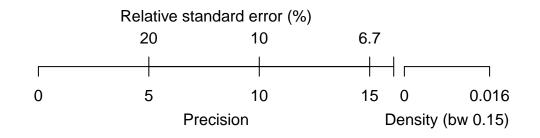






n = 62 | in 2 sigma = 41.9 %





DRC Summary



Example data

















Example data







Filter Combination



Filter Combination





Growth curve

 $D_e = 1737.88 \pm 57.45$ | fit: EXP

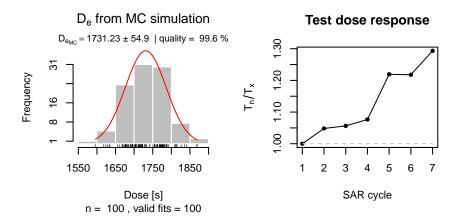




Growth curve

 $D_e = 1737.88 \pm 54.9$ | fit: EXP





Growth curve

 $D_e = 1737.88 \pm 64.53$ | fit: EXP



D_e from MC simulation



n = 100, valid fits = 100





Growth curve







Growth curve





Growth curve





Histogram



Histogram of De-values

Example data set







Dose distribution















NR(t) Plot

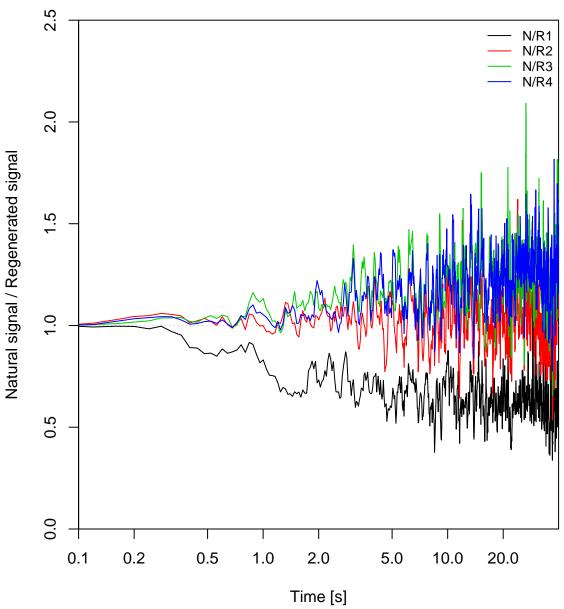






NR(t) Plot

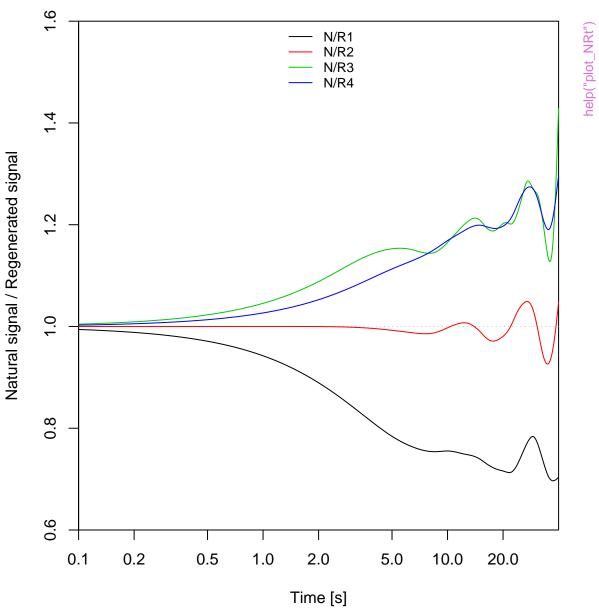
help("plot_NRt")











TnTx(t) Plot















TL combined



TL combined



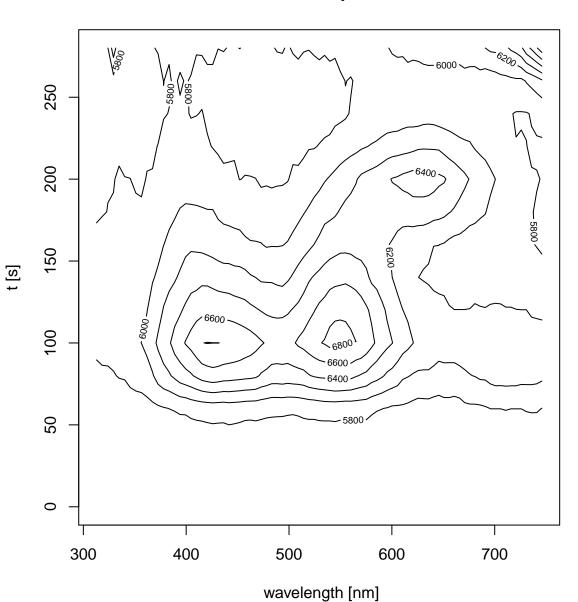
unkown curve type



RLum.Data.Image

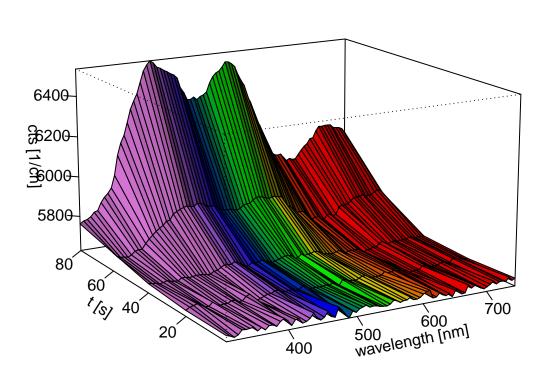


RLum.Data.Spectrum

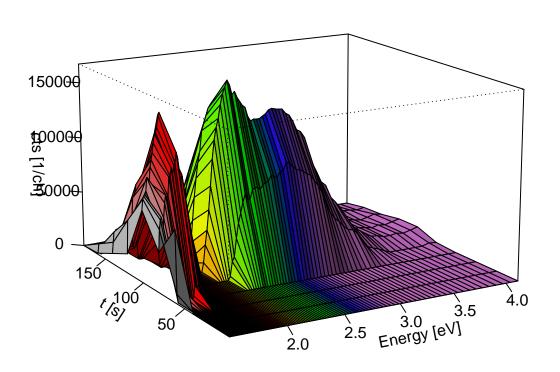


help("plot_RLum.Data.Spectrum")

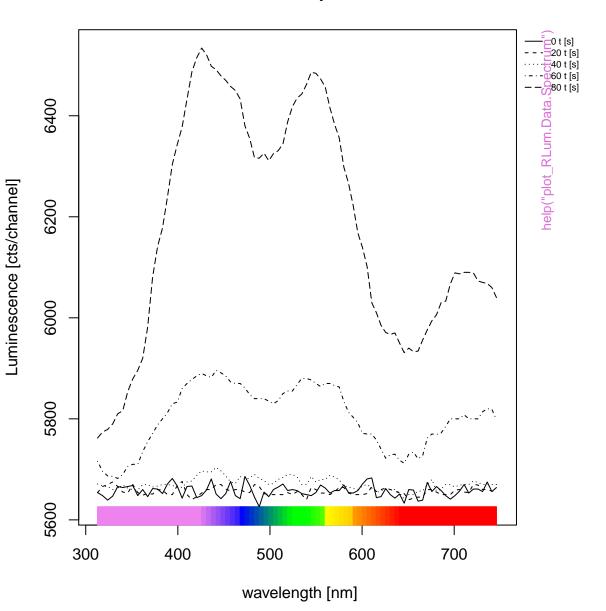
RLum.Data.Spectrum



RLum.Data.Spectrum



RLum.Data.Spectrum



unkown curve type





0.0

0.45

0.55

p0

0.65

0.75

Monte Carlo Simulation

$$n = |\hat{\mu} = 45|\hat{\sigma} = 21|\frac{\hat{\sigma}}{\sqrt{n}} = 2|v = 0.84|$$





















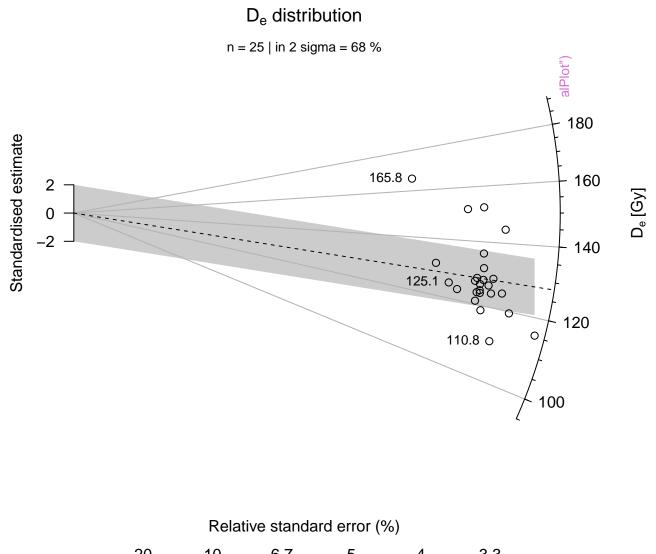


Precision





Data precision









D_e distribution















 $n = 25 \mid median = 126.34$

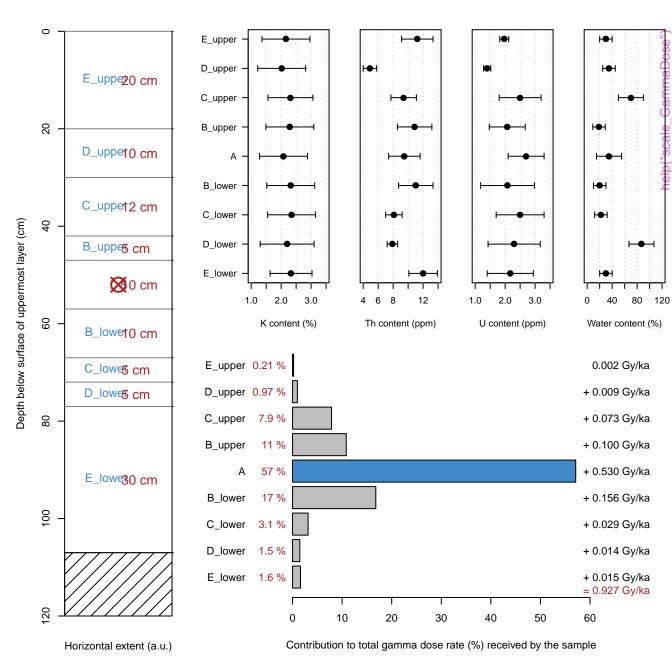
USER combined 30 Curve 1 Curve 2 Curve 3 USER [a.u.] 10 0 -20 2 14 6 10 NA **OSL** combined 80000 Curve 1 OSL [a.u.] 50000 20000 0 80 40

Time [s]



help("read_PSL2R")





OSL



OSL



OSL



D_{e} distribution





Standardised estimate



D_{e} distribution





Standardised estimate

