LABJND lightness L^*, tristimulus value discrimination dY, contrast (Y/dY), and sensitivity(dY/Y)

LABJND lightness for all colours, L^*_w=50 for Y_u=18

$L^* = S_{xn}\,(x_n)^{cn}$ (Y_n=100, Y > 1)

For the grey discrimination we get:

$dL^*/dY = (116/Y_n)\ (1/3)\ (Y/Y_n)^{-2/3}$

and for dL^*=1 (about 3 thresholds) we can write:

$dY = 3\ (Y_n/116)\ (Y/Y_n)^{2/3}$

or $\log(dY) = \log(\ 3\ (Y_n/116)\ ) + (2/3)\ \log(Y/Y_n)$

therefore in a log-log diagram the slope is (2/3).

for the CIE contrast sensitivity, and for dL^* = 1 it is valid:

$Y/dY = (1/3)\ (116/Y_n)\ (Y/Y_n)^{1/3}$

or $\log(Y/dY) = \log(\ (1/3)\ (116/Y_n)\ ) + (1/3)\ \log(Y/Y_n)$

eer30−1n

CIELAB lightness L^*, CIE tristimulus value discrimination $dY$and CIE contrast sensitivity (Y/dY)

CIELAB lightness for all colours L^*_w=100:

$L^* = 116\ (Y/Y_n)^{1/3} - 16$ (Y_n=100, Y > 1)

For the grey discrimination we get:

$dL^*/dY = (116/Y_n)\ (1/3)\ (Y/Y_n)^{-2/3}$

and for dL^*=1 (about 3 thresholds) we can write:

$dY = (3(Y_n^{1/3})/116)\ (Y)^{2/3}$

or $\log(dY) = \log(3(Y_n^{1/3})/116) + (2/3)\ \log(Y)$

therefore in a log-log diagram the slope is (2/3).

for the CIE contrast sensitivity, and for dL^* = 1 it is valid:

$Y/dY = (1/3)\ (116/(Y_n^{1/3}))\ Y^{1/3}$

or $\log(Y/dY) = \log(\ (1/3)\ (116/(Y_n^{1/3}))\ ) + (1/3)\ \log(Y)$

eer30−2n

sRGB-triangle lightness t^*, CIE tristimulus value discrimination dY and CIE contrast (Y/dY) sRGB: see IEC 61966-2-1

sRGB-triangle lightness for *achromatic* colours: W

$t^*_{sRGB,100} = 100\ (Y/Y_n)^{1/2,4}$ (Y_n=100)

For the grey discrimination we get:

$dt^*_{sRGB,100}/dY = (1/2,4)\ (Y/Y_n)^{-1,4/2,4} = 0,42\ (Y/Y_n)^{-0,58}$

and for $dt^*_{sRGB,100}$=1 (about 3 thresholds) we can write:

$dY = 2,4\ (Y/Y_n)^{1,4/2,4}$

or $\log(dY) = \log(2,4) + (1,4/2,4)\ \log(Y/Y_n)$

therefore in a log-log diagram the slope is 1,4/2,4.

for the CIE contrast sensitivity, and for $dt^*_{sRGB,100}$=1:

$Y/dY = (Y_n^{1,4/2,4}/2,4)\ (Y/Y_n)^{1/2,4}$

or $\log(Y/dY) = \log(Y_n^{1,4/2,4}/2,4) + 1/2,4\ \log(Y/Y_n)$

eer31−1n

sRGB-triangle lightness t^*, CIE tristimulus value discrimination dY and CIE contrast (Y/dY) sRGB: see IEC 61966-2-1

sRGB-triangle lightness for *achromatic* colours: RGB

$t^*_{sRGB,100} = 100\ (Y/Y_n)^{1/2,4}$ (Y_n=22(R), =71(G), =07(B))

For the discrimination we get:

$dt^*_{sRGB,100}/dY = (1/2,4)\ (Y/Y_n)^{-1,4/2,4} = 0,42\ (Y/Y_n)^{-0,58}$

and for $dt^*_{sRGB,100}$=1 (about 3 thresholds) we can write:

$dY = 2,4\ (Y/Y_n)^{1,4/2,4}$

or $\log(dY) = \log(2,4) + (1,4/2,4)\ \log(Y/Y_n)$

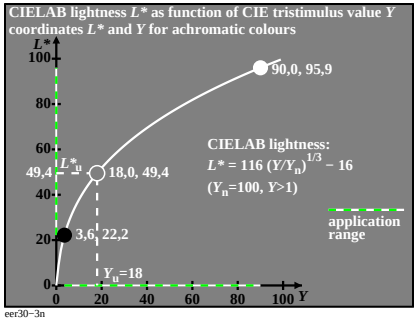
therefore in a log-log diagram the slope is 1,4/2,4.

for the CIE contrast sensitivity, and for $dt^*_{sRGB,100}$=1:

$Y/dY = (Y_n^{1,4/2,4}/2,4)\ (Y/Y_n)^{1/2,4}$

or $\log(Y/dY) = \log(Y_n^{1,4/2,4}/2,4) + 1/2,4\ \log(Y/Y_n)$

eer31−2n



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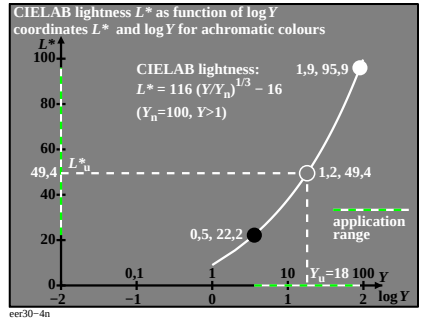

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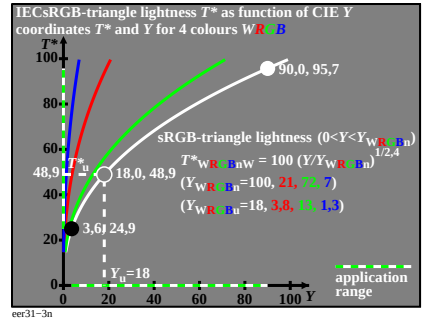

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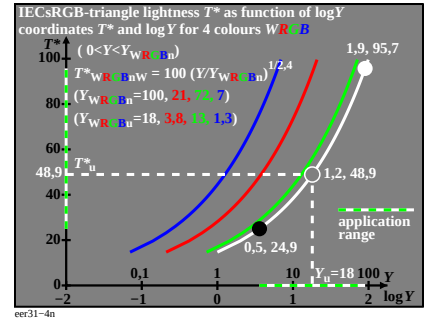

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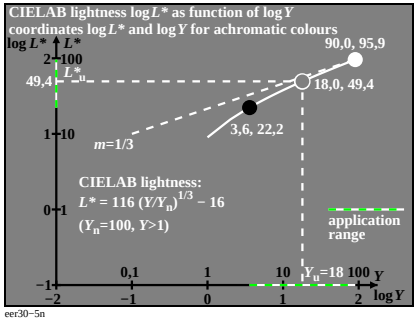

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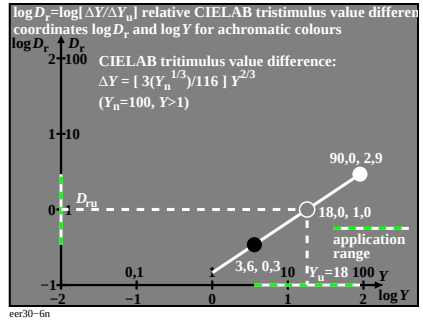

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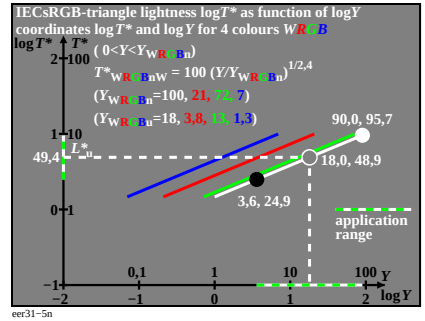

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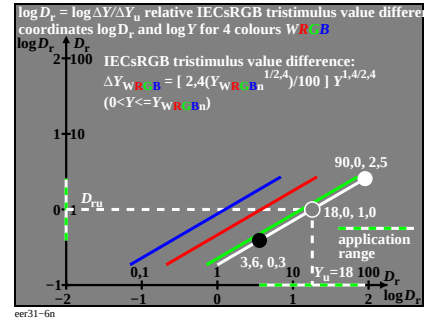

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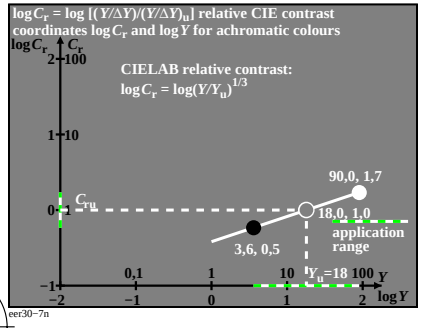

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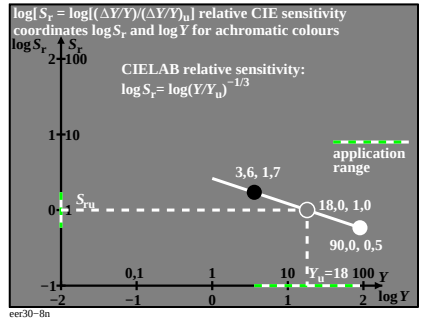

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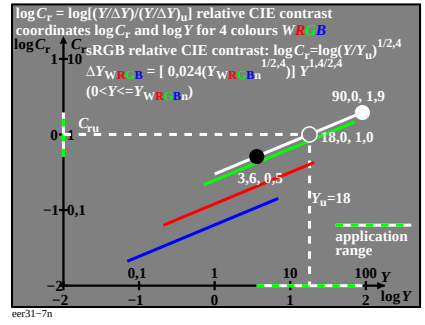

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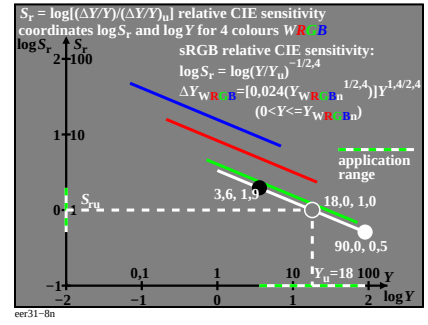

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