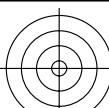


6
8

V L O Y M C

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8

<http://farbe.li.tu-berlin.de/hex1/hex110np.pdf/.ps>; only vector graphic VG; start output
see similar files: <http://farbe.li.tu-berlin.de/hex1/hex1.htm>



see similar files of the whole serie: <http://farbe.li.tu-berlin.de> or <http://color.li.tu-berlin.de>

technical information: see similar files: <http://farbe.li.tu-berlin.de/hex1/hex1.htm>

LABJND colour-difference formula of CIE 230:2019
Main integral equations with Y and Y_u of surround u

$$dY = A_1[1+A_2Y] \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,3343 \quad [5d]$$

$$dY_r = A_1[1+A_{2u}Y_r] \quad A_1=0,0170, A_{2u}=5,931, Y_r=(Y/Y_u) \quad [6d]$$

$$\frac{1}{A_1} \int \frac{dY}{1+A_2Y} = \frac{1}{A_1A_2} \ln |1+A_2Y| = F^*(Y) \quad (A_3=1) \quad [5i]$$

$$dY = A_1[1+A_2Y]A_3 \quad \text{error } 0,0018 \quad A_1=0,0251, A_2=0,1566, A_3=1,107 \quad [7d]$$

$$dY_r = A_1[1+A_{2u}(Y_r)]A_3 \quad A_1=0,0251, A_{2u}=2,778, A_3=1,107 \quad [8d]$$

$$\frac{1}{A_1} \int \frac{dY}{1+A_2Y} = \frac{1}{A_1} \frac{[1+A_2Y]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y) \quad (A_3=1) \quad [7i]$$

hex10-1n

LABJND colour-difference formula of CIE 230:2019
Main integral equations with $Y_r=Y/Y_u$ of surround u

$$dY = A_1[1+A_2Y] \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,3343 \quad [5d]$$

$$dY_r = A_1[1+A_{2u}Y_r] \quad A_1=0,0170, A_{2u}=5,931, Y_r=(Y/Y_u) \quad [6d]$$

$$\frac{1}{A_1} \int \frac{dY_r}{1+A_{2u}Y_r} = \frac{1}{A_1A_{2u}} \ln |1+A_{2u}Y_r| = F^*(Y_r) \quad (A_3=1) \quad [6i]$$

$$dY = A_1[1+A_2Y]A_3 \quad \text{error } 0,0018 \quad A_1=0,0251, A_2=0,1566, A_3=1,107 \quad [7d]$$

$$dY_r = A_1[1+A_{2u}(Y_r)]A_3 \quad A_1=0,0251, A_{2u}=2,778, A_3=1,107 \quad [8d]$$

$$\frac{1}{A_1} \int \frac{dY_r}{1+A_{2u}Y_r} = \frac{1}{A_1} \frac{[1+A_{2u}Y_r]^{(A_3+1)}}{A_{2u}(A_3+1)} = F^*(Y_r) \quad (A_3=1) \quad [8i]$$

hex10-2n

LABJND colour-difference formula of CIE 230:2019
Modifications with normalization to Y_u of surround

$$dY = A_1+A_2Y \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,0058 \quad [1]$$

$$= A_1+A_{2u}(Y/Y_u) \quad A_1=0,0170, A_{2u}=0,1004=A_2Y_u \quad [2]$$

$$dY = A_1+A_2Y^A_3 \quad \text{error } 0,0019 \quad A_1=0,0258, A_2=0,0036, A_3=1,087 \quad [3]$$

$$= A_1+A_{2u}(Y/Y_u)^A_3 \quad A_1=0,0258, A_{2u}=0,0823, A_3=1,087 \quad [4]$$

$$dY = A_1[1+A_2Y] \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,3343 \quad [5]$$

$$= A_1[1+A_{2u}(Y/Y_u)] \quad A_1=0,0170, A_{2u}=5,931=A_2Y_u \quad [6]$$

$$dY = A_1[1+A_2Y]^A_3 \quad \text{error } 0,0018 \quad A_1=0,0251, A_2=0,1566, A_3=1,107 \quad [7]$$

$$= A_1[1+A_{2u}(Y/Y_u)]^A_3 \quad A_1=0,0251, A_{2u}=2,778, A_3=1,107 \quad [8]$$

hex10-3n DEQ30-3N

LABJND colour-difference formula of CIE 230:2019
Modifications with normalization to Y_u of surround

$$dY = A_1+A_2Y \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,0058 \quad [1d]$$

$$= A_1+A_{2u}(Y/Y_u) \quad A_1=0,0170, A_{2u}=0,1004=A_2Y_u \quad [2d]$$

$$\int \frac{dY_r}{A_1+A_2Y_r} = \frac{1}{A_2} \ln |A_1+A_2Y_r| = F^*(Y_r) \quad (A_3=1) \quad [2i]$$

$$dY = A_1[1+A_2Y] \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,3343 \quad [5d]$$

$$= A_1[1+A_{2u}(Y/Y_u)] \quad A_1=0,0170, A_{2u}=5,931=A_2Y_u \quad [6d]$$

$$\frac{1}{A_1} \int \frac{dY_r}{1+A_2Y_r} = \frac{1}{A_1A_2} \ln |1+A_2Y_r| = F^*(Y_r) \quad (A_3=1) \quad [5i]$$

hex10-4n DEQ30-4N

LABJND colour-difference formula of CIE 230:2019
Modifications with normalization to Y_u of surround

$$dY = A_1+A_2Y \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,0058 \quad [1d]$$

$$dY_r = A_1+A_{2u}Y_r \quad A_1=0,0170, A_{2u}=0,1004, Y_r=(Y/Y_u) \quad [2d]$$

$$\int \frac{dY_r}{A_1+A_2Y_r} = \frac{1}{A_2} \ln |A_1+A_2Y_r| = F^*(Y_r) \quad (A_3=1) \quad [2i]$$

$$dY = A_1[1+A_2Y] \quad \text{error } 0,0044 \quad A_1=0,0170, A_2=0,3343 \quad [5d]$$

$$dY_r = A_1[1+A_{2u}Y_r] \quad A_1=0,0170, A_{2u}=5,931, Y_r=(Y/Y_u) \quad [6d]$$

$$\frac{1}{A_1} \int \frac{dY_r}{1+A_2Y_r} = \frac{1}{A_1A_2} \ln |1+A_2Y_r| = F^*(Y_r) \quad (A_3=1) \quad [6i]$$

hex10-5n DEQ30-5N

LABJND colour-difference formula of CIE 230:2019
Modifications with normalization to Y_u of surround

$$dY = A_1+A_2Y^A_3 \quad \text{error } 0,0019 \quad A_1=0,0258, A_2=0,0036, A_3=1,087 \quad [3d]$$

$$= A_1+A_{2u}(Y/Y_u)^A_3 \quad A_1=0,0258, A_{2u}=0,0823, A_3=1,087 \quad [4d]$$

$$\int \frac{dY_r}{A_1+A_2Y_r} = A_1Y_r + \frac{A_2[Y_r]^{A_3+1}}{A_3+1} = F^*(Y_r) \quad (A_3=1) \quad [3i]$$

$$dY = A_1[1+A_2Y]A_3 \quad \text{error } 0,0018 \quad A_1=0,0251, A_2=0,1566, A_3=1,107 \quad [7d]$$

$$= A_1[1+A_{2u}(Y/Y_u)]A_3 \quad A_1=0,0251, A_{2u}=2,778, A_3=1,107 \quad [8d]$$

$$\frac{1}{A_1} \int \frac{dY_r}{1+A_2Y_r} = \frac{1}{A_1} \frac{[1+A_2Y_r]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y_r) \quad (A_3=1) \quad [7i]$$

hex10-6n DEQ30-6N

LABJND colour-difference formula of CIE 230:2019
Modifications with normalization to Y_u of surround

$$dY = [A_1+A_2Y]^A_3 \quad \text{error } 0,0018 \quad A_1=0,0358, A_2=0,00561, A_3=1,107 \quad [9d]$$

$$= [A_1+A_{2u}(Y/Y_u)]^A_3 \quad A_1=0,0358, A_{2u}=0,0995, A_3=1,107 \quad [10d]$$

$$\int \frac{dY}{(A_1+A_2Y)^A_3} = \frac{[A_1+A_2Y]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y) \quad A_3 \neq 1 \quad [9i]$$

$$dY = A_1[1+A_2Y]^A_3 \quad \text{error } 0,0018 \quad A_1=0,0251, A_2=0,1566, A_3=1,107 \quad [7d]$$

$$= A_1[1+A_{2u}(Y/Y_u)]^A_3 \quad A_1=0,0251, A_{2u}=2,778, A_3=1,107 \quad [8d]$$

$$\frac{1}{A_1} \int \frac{dY}{1+A_2Y} = \frac{1}{A_1} \frac{[1+A_2Y]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y) \quad A_3 \neq 1 \quad [7i]$$

hex10-7n DEQ30-7N

LABJND colour-difference formula of CIE 230:2019
Modifications with normalization to Y_u of surround

$$dY = A_1+A_2Y^A_3 \quad \text{error } 0,0019 \quad A_1=0,0258, A_2=0,0036, A_3=1,087 \quad [3d]$$

$$= A_1+A_{2u}(Y/Y_u)^A_3 \quad A_1=0,0258, A_{2u}=0,0823, A_3=1,087 \quad [4d]$$

$$\int \frac{dY_r}{A_1+A_2Y_r} = A_1Y_r + \frac{A_{2u}[Y_r]^{A_3+1}}{A_3+1} = F^*(Y_r) \quad (A_3=1) \quad [4i]$$

$$dY = A_1[1+A_2Y]A_3 \quad \text{error } 0,0018 \quad A_1=0,0251, A_2=0,1566, A_3=1,107 \quad [7d]$$

$$= A_1[1+A_{2u}(Y/Y_u)]A_3 \quad A_1=0,0251, A_{2u}=2,778, A_3=1,107 \quad [8d]$$

$$\frac{1}{A_1} \int \frac{dY_r}{1+A_2Y_r} = \frac{1}{A_1} \frac{[1+A_2Y_r]^{(A_3+1)}}{A_{2u}(A_3+1)} = F^*(Y_r) \quad (A_3=1) \quad [8i]$$

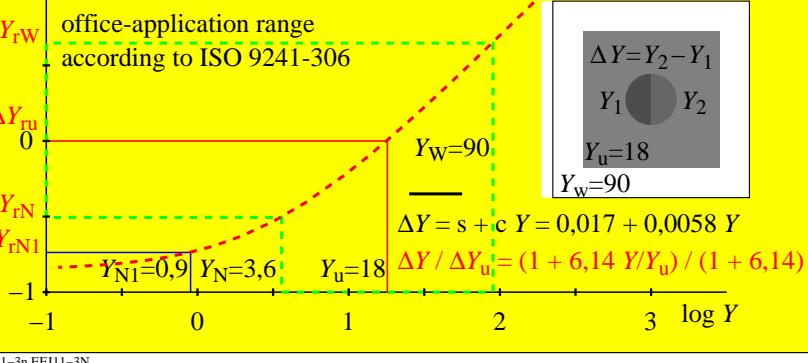
hex10-8n DEQ30-8N

Normalized NW-achromatic thresholds $\Delta Y_{ru} = \Delta Y / \Delta Y_u$ as function of Y

experiments and data: BAM-research report no. 115 (1985), page 72, see
 $\log[\Delta Y_{ru} = \Delta Y / \Delta Y_u]$ <https://nbn-resolving.org/urn:nbn:de:kobv:b43-3350>

↑ tristimulus value threshold ΔY , see LABJND in TR CIE 230:219
Validity of Formulae for predicting Small Colour Differences

The performance of 8 datasets: http://files.cie.co.at/TC181_Datasets.zip
is best for LABJND in 5 cases, for CIELAB & CMC & CIEDE2000
all in one case, see Table 9 and 11 for the range $0 \leq \Delta E_{ab}^* < 2$.

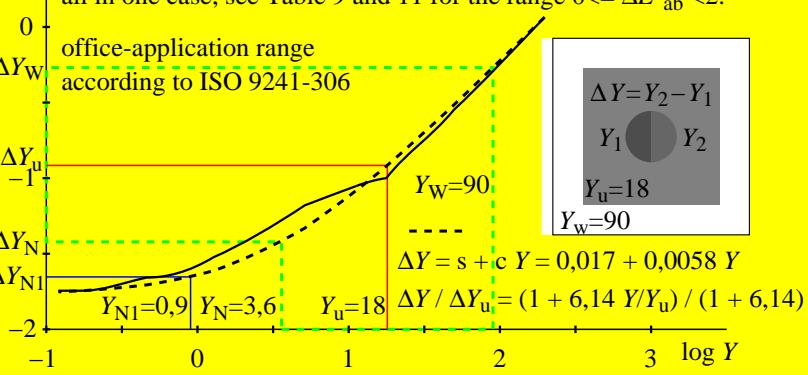


NW-achromatic thresholds ΔY as function of Y

experiments and data: BAM-research report no. 115 (1985), page 72, see
 $\log[\Delta Y]$ <https://nbn-resolving.org/urn:nbn:de:kobv:b43-3350>

↑ tristimulus value threshold ΔY , see LABJND in TR CIE 230:219
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TUB-test chart hex1; CIE Y and lightness L^* for surface colours and for light-display colours
Line-element optimization of the colour difference formula LABJND according to CIE 230:2019