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

error

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

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

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

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

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

$$\frac{1}{A_1}\int\frac{dY}{[1+A_2Y]^{A_3}} = \frac{1}{A_1}\frac{[1+A_2Y]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y) \quad (A_3\neq1)\ [7i]$$

hex10−1n

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

error

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

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

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

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

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

$$\frac{1}{A_1}\int\frac{dY_r}{[1+A_{2u}Y_r]^{A_3}} = \frac{1}{A_1}\frac{[1+A_{2u}Y_r]^{(A_3+1)}}{A_{2u}(A_3+1)} = F^*(Y_r) \quad (A_3\neq1)\ [8i]$$

hex10−2n

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

error

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

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

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

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

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

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

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

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

hex10−3n DEQ30−3N

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

error

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

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

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

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

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

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

hex10−4n DEQ30−4N

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

error

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

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

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

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

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

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

hex10−5n DEQ30−5N

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

error

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

$=A_1+A_{2u}(Y/Y_u)^{A_3}$ — $A_1=0{,}0258,\ A_{2u}=0{,}0826,\ A_3=1{,}087$ [4d]

$$\int\frac{dY}{A_1+A_2[Y]^{A_3}} = A_1Y+\frac{A_2[Y]^{(A_3+1)}}{A_3+1} = F^*(Y) \quad (A_3\neq1)\ [3i]$$

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

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

$$\frac{1}{A_1}\int\frac{dY}{[1+A_2Y]^{A_3}} = \frac{1}{A_1}\frac{[1+A_2Y]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y) \quad (A_3\neq1)\ [7i]$$

hex10−6n DEQ30−6N

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

error

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

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

$$\int\frac{dY}{(A_1+A_2Y)^{A_3}} = \frac{[A_1+A_2Y]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y) \quad A_3\neq1\ [9i]$$

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

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

$$\frac{1}{A_1}\int\frac{dY}{[1+A_2Y]^{A_3}} = \frac{1}{A_1}\frac{[1+A_2Y]^{(A_3+1)}}{A_2(A_3+1)} = F^*(Y) \quad A_3\neq1\ [7i]$$

hex10−7n DEQ30−7N

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

error

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

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

$$\int\frac{dY_r}{A_1+A_{2u}[Y_r]^{A_3}} = A_1Y_r+\frac{A_{2u}[Y_r]^{(A_3+1)}}{A_3+1} = F^*(Y_r) \quad (A_3\neq1)\ [4i]$$

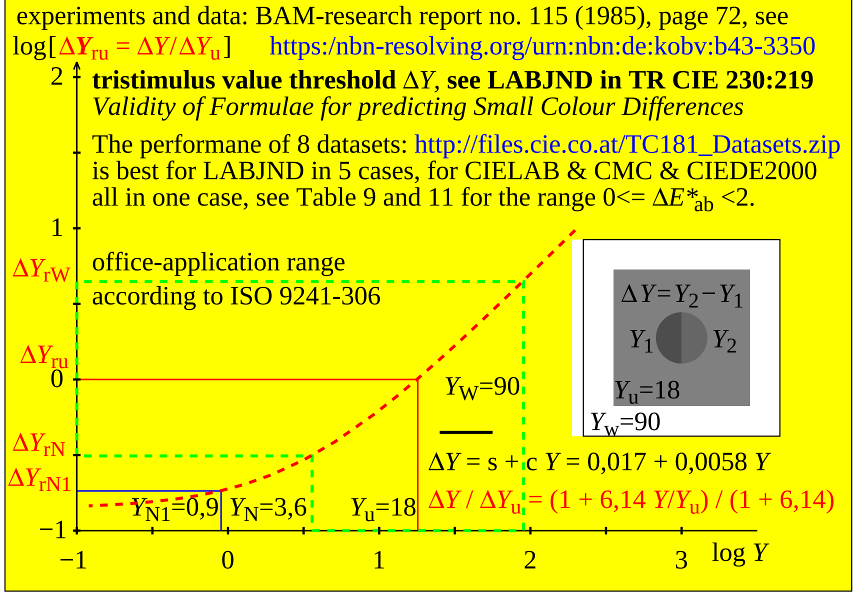
$dY=A_1[1+A_2Y]^{A_3}$ — 0,0018 — $A_1=0{,}0251,\ A_2=0{,}1566,\ A_3=1{,}107$ [7d]

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

$$\frac{1}{A_1}\int\frac{dY_r}{[1+A_{2u}Y_r]^{A_3}} = \frac{1}{A_1}\frac{[1+A_{2u}Y_r]^{(A_3+1)}}{A_{2u}(A_3+1)} = F^*(Y_r) \quad (A_3\neq1)\ [8i]$$

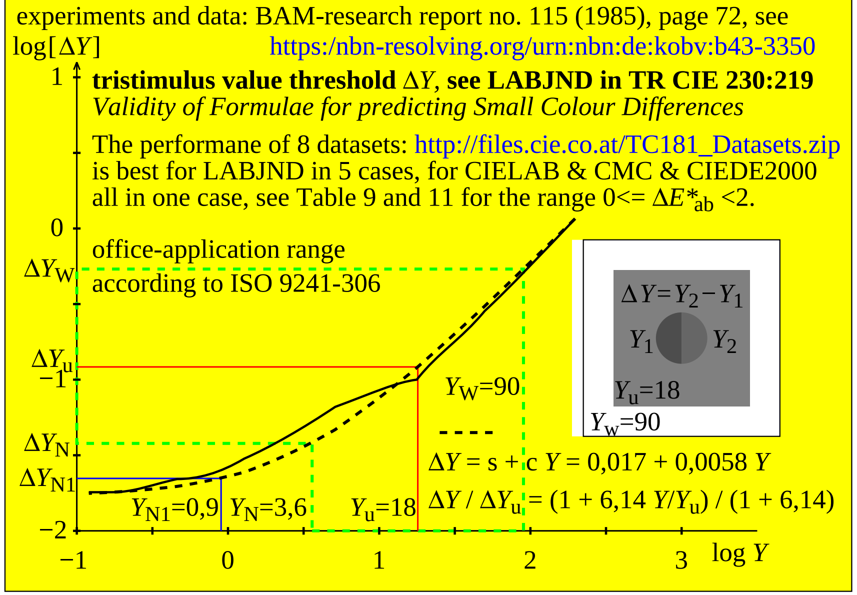
hex10−8n DEQ30−8N

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



hex11−3n EEJ11−3N

***NW*-achromatic thresholds ΔY as function of Y**



hex11−7n EEJ11−7N

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