

color space CIELAB 1976, color values, -attributes, -chromaticities (a*, b*)

tristimulus values X, Y, Z -> color attributes L*, a*, b*

$$\begin{aligned} \text{lightness } L^* &= 116 (Y/Y_n)^{1/3} - 16 \\ \text{RG chromaticness } a^* &= 500 [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] = 500 [a' - a'_n] Y^{1/3} \\ \text{JB chromaticness } b^* &= 200 [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] = 500 [b' - b'_n] Y^{1/3} \end{aligned}$$

color attributes L*, a*, b* -> tristimulus values X, Y, Z

$$\begin{aligned} \text{tristimulus values } X &= X_n [(L^* + 16) / 116 + a^*/500]^3 \\ Y &= Y_n [(L^* + 16) / 116]^3 \\ Z &= Z_n [(L^* + 16) / 116 - b^*/200]^3 \end{aligned}$$

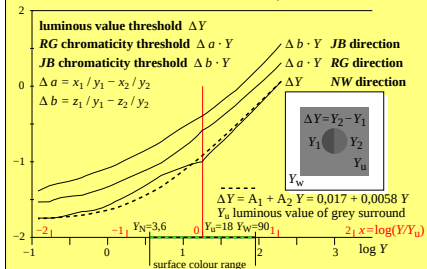
chromaticity for CIELAB 1976, LABHNU 1977, LABHNUx 1979

$$\begin{aligned} \text{CIELAB 1976, } 2^0 \quad a' &= 0,2191 (x/y)^{1/3} \quad b' = -0,08376 (z/y)^{1/3} \\ \text{LABHNU 1977} \quad a' &= (x/y + 1/6)^{1/3} / 4 \quad b' = -(z/y + 1/6)^{1/3} / 12 \\ \text{LABHNU1 1979} \quad a' &= (x/y + 1) / 15 \text{ linear!} \quad b' = -(z/y + 1/6)^{1/3} / 12 \\ \text{LABHNU2 1979} \quad a' &= (x/y + 1/6)^{2/3} / 15 \quad b' = -(z/y + 1/6)^{1/3} / 12 \\ \text{CIELAB 1976, } 10^0 \quad a' &= 0,2193 (x_{10}/y_{10})^{1/3} \quad b' = -0,08417 (z_{10}/y_{10})^{1/3} \\ \text{chromaticity constants } a_2 &= 500 (1/X_n)^{1/3} = 0,2191 \quad b_2 = -200 (1/Z_n)^{1/3} = -0,08376 \\ \text{CIELAB, } 2^0, 10^0 \quad a_{10} &= 500 (1/X_{n,10})^{1/3} = 0,2193 \quad b_{10} = -200 (1/Z_{n,10})^{1/3} = -0,08417 \end{aligned}$$

CESI0-3N

Thresholds: NW achromatic and RG & JB chromatic as function of Y

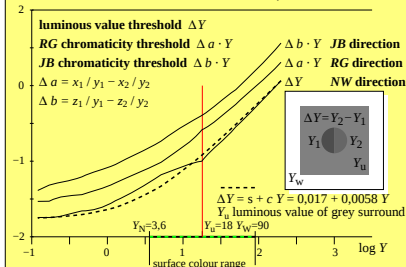
Experiments and data: BAM-research report no. 115 (1985), page 72
Data used for colour-difference formula LABJND, see CIE:2019



CESI0-7N

Thresholds: NW achromatic and RG & JB chromatic as function of Y

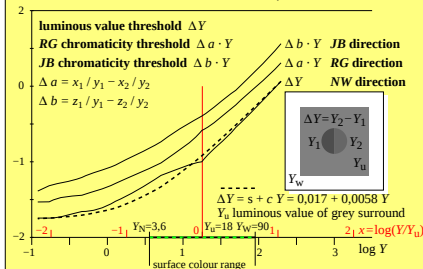
Experiments and data: BAM-research report no. 115 (1985), page 72
Data used for colour-difference formula LABJND, see CIE:2019



CESI1-3N

Thresholds: NW achromatic and RG & JB chromatic as function of Y

Experiments and data: BAM-research report no. 115 (1985), page 72
Data used for colour-difference formula LABJND, see CIE:2019



CESI1-7N