L^* and L^*/L^*_u — **CIELAB lightness L^* normalized to the background lightness L^*_u**

text lightness

$$L^* = s\,(Y/Y_n)^n - d \qquad (Y_n=100,\ Y_u=18,\ s=116,\ n=1/3,\ d=16) \qquad [1a]$$

$$L^* = r\,(Y/Y_u)^n - d \qquad (r = s\,(Y_u/Y_n)^n = 65{,}49,\ L^*_u = r - d) \qquad [1b]$$

text relative lightness

$$L^*/L^*_u = g\,(Y/Y_u)^n - h \qquad (g=r/(r-d)=1{,}32,\ h=d/(r-d)=0{,}32) \qquad [1c]$$

text log(L*/L*u)

$$\log\left[(L^*/L^*_u + h)\,/\,g\right] = n \log (Y/Y_u) \qquad [1d]$$

text ln(L*/Lu)

$$\ln\left[(L^*/L^*_u + h)\,/\,g\right] = \ln(10)\, n \log (Y/Y_u) \qquad [1e]$$

text L*/L*u=ex**

$$(L^*/L^*_u + h)\,/\,g\,] = e^{\ln(10)\, n \log (Y/Y_u)} \qquad [1f]$$