

Higher colormetric (color data: nonlinear relation to CIE 1931 data)		
non linear color terms	name and relationship with tristimulues or chromaticity values	notes
lightness	$L^* = 116 (Y / 100)^{1/3} - 16 \quad (Y > 0,8)$ Approximation: $L^* = 100 (Y / 100)^{1/2,4}$	CIELAB 1976
chroma red-green yellow-blue radial	<i>non linear transform of chromatic values A and B</i> $a^* = 500 [(X / X_n)^{1/3} - (Y / Y_n)^{1/3}]$ $= 500 (a' - a'_n) Y^{1/3}$ $b^* = 200 [(Y / Y_n)^{1/3} - (Z / Z_n)^{1/3}]$ $= 500 (b' - b'_n) Y^{1/3}$ $C^*_{ab} = [a^{*2} + b^{*2}]^{1/2}$	CIELAB 1976 <i>n=D65 (backgr.)</i> CIELAB 1976
chromaticity red-green yellow-blue radial	<i>nonlinear transform of chromaticities a=x/y and b=z/y</i> $a' = (1 / X_n)^{1/3} (x / y)^{1/3}$ $= 0,2191 (x / y)^{1/3} \quad \text{for } D65$ $b' = - 0,4 (1 / Z_n)^{1/3} (z / y)^{1/3}$ $= - 0,08376 (z / y)^{1/3} \quad \text{for } D65$ $c'_{ab} = [(a' - a'_n)^2 + (b' - b'_n)^2]^{1/2}$	compare to log cone excitation $\log[\mathbf{P} / (\mathbf{P}+\mathbf{D})]$ $= \log[\mathbf{L} / (\mathbf{L}+\mathbf{M})]$ $\log[\mathbf{T} / (\mathbf{P}+\mathbf{D})]$ $= \log[\mathbf{S} / (\mathbf{L}+\mathbf{M})]$