Colour space CIELAB 1976 (color data: nonlinear relation to CIE 1931)

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