

Hyperbolic response function of achromatic vision space T^*_{HYP3}

nonlinear color terms	name and relationship with test field luminance L	notes
threshold sum T^*_{HYP3}	$T^*_{HYP3} = A_1 \cdot L^t / (L^t + A_2); \quad X = L^t$ $= A_1 \cdot X / (X + A_2); \quad dX/dL = t \cdot X^{t-1}$ alternative: $A_2 = A_{2x}^t$	<i>T. Seim</i> 2014: exponent: $t = 0,8$ for presentation time: $t_p = 0,1s$ of <i>Avramopoulos</i> experiments 1989
CIE luminance contrast sensitivity threshold L / dL	$dT^*_{HYP3} / dX = A_1 \cdot A_2 / (X + A_2)^2$ $dT^*_{HYP3} / dL = dT^*_{HYP3} / dX \cdot dX / dL$ $dT^*_{HYP3} / dL = A_1 \cdot A_2 \cdot t \cdot X^{t-1} / (X + A_2)^2$ for $dT^*_{HYP3}=1$, and multiplication with L: $L / dL = A_1 \cdot A_2 \cdot t \cdot X / (X + A_2)^2$ $= A_1 \cdot A_2 \cdot t \cdot L^t / (L^t + A_2)^2$	Hyperbolic function: $T^*_{max} = A_1$ $T^*_{average} = 0,5 \cdot A_1$ $A_{2x} = A_2^{1/t}$
CIE luminance difference threshold dL	$dL = L \cdot (L^t + A_2)^2 / (A_1 \cdot A_2 \cdot t \cdot L^t)$ $= (L^t + A_2)^2 / (A_1 \cdot A_2 \cdot t \cdot L^{t-1})$	