

Achromatic receptor response function

$$F_{bv}[x_v/a]; x_v = \log(\text{relative v-luminance})$$

with $x_v = \log [L/L_v]$ (L = test luminance)

$L_v = L_u + \Delta L_u$ = effective surround luminance

$$F_{bv}[x_v/a] = b \frac{e^{x_v/a} - e^{-x_v/a}}{e^{x_v/a} + e^{-x_v/a}} = b \tanh [x_v/a]$$

function values for $b=1$ and $a>0$:

$$F_{1v}[(x-v)/a \rightarrow -\infty] = -1 \quad x = \log L$$

$$F_{1v}[(x-v)/a = 0] = 0 \quad v = \log(L_u + \Delta L_u)$$

$$F_{1v}[(x-v)/a \rightarrow +\infty] = +1$$