

Achromatic receptor response function

$$F_{bu}[x_r/a]; x_r = \log(\text{relative luminance})$$

with $x_r = \log [L/L_u]$ (L = test luminance)

L_u = surround luminance

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

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

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

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

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