

Achromatic receptor-response function

$$F_{ab}[x_r/a'] \quad x_r = \log(\text{relative luminance})$$

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

L_u = surround luminance

$$F_{ab}[x_r/a'] = b \frac{10^{x_r/a'} - 10^{-x_r/a'}}{10^{x_r/a'} + 10^{-x_r/a'}} = b \tanh [x_r/a']$$

function values for $b=1$ and $a' = a \ln(10) > 0$:

$$F_{a1}[x_r/a' \rightarrow -\infty] = -1 \quad x = \log L, \quad u = \log L_u$$

$$F_{a1}[x_r/a' = 0] = 0 \quad x_r = \log [L/L_u]$$

$$F_{a1}[x_r/a' \rightarrow +\infty] = +1 \quad = x - u$$