Achromatic colour vision with relative luminance
Mathematical equations with potential functions

$$F_{cb}(L_r,n) = b\tanh(x_r/c) = b\frac{L_r^n - L_r^{-n}}{L_r^n + L_r^{-n}} \qquad x_r=\log(L_r),\ L_r=L/L_u,\ x_r>=0 \quad [1]$$

$$\frac{dF_{cb}(L_r,n)}{dL_r} = \frac{4bm}{L_r[L_r^n+L_r^{-n}]^2} \qquad x_r=\ln L_r/\ln(10),\ dx_r/dL_r=1/(\ln(10)L_r),\ n=1/(\ln(10)c) \quad [5]$$

$$\frac{L/dL}{(L/dL)_u} = \frac{4L}{L_r[L_r^n+L_r^{-n}]^2 L_u};\quad \frac{dL}{dL_u} = \frac{L_r[L_r^n+L_r^{-n}]^2}{4} \quad [8]$$

$$\frac{L/dL}{(L/dL)_u}=1 \text{ for } \begin{cases} L=L_u \\ x_r=0 \end{cases} \qquad \frac{dL}{dL_u}=1 \text{ for } \begin{cases} L=L_u \\ x_r=0 \end{cases} \quad [9]$$

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