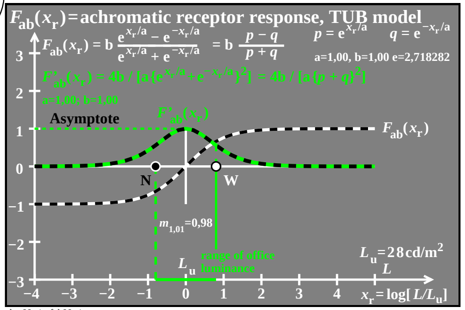
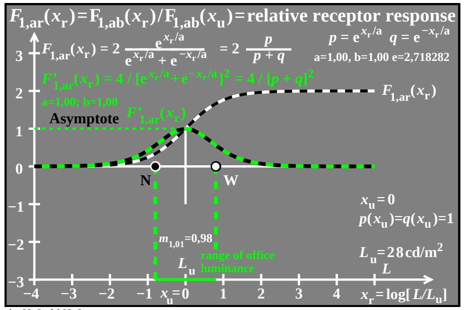
see similar files of the whole serie: http://farbe.li.tu-berlin.de/hers.htm
technical information: http://farbe.li.tu-berlin.de or http://color.li.tu-berlin.de



her00−1n fek00−1n



her00−2n fek00−2n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

$$F_{ab}(x/a) = b\tanh(x/a) = b\frac{e^{x/a}-e^{-x/a}}{e^{x/a}+e^{-x/a}} = b\frac{u(x/a)}{v(x/a)} \quad [1]$$

$$F'_{ab}(x/a) = b\frac{u'(x/a)\,v(x/a) - u(x/a)\,v'(x/a)}{v^2(x/a)} \quad [2]$$

$$F'_{ab}(x/a) = b\frac{v^2(x/a) - u^2(x/a)}{a\,v^2(x/a)} \quad [3]$$

$$F'_{ab}(x/a) = \frac{4b}{a\,[e^{x/a}+e^{-x/a}]^2} = \frac{b}{a\cosh^2(x/a)} \quad [4]$$

her01−1n fek01−1n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

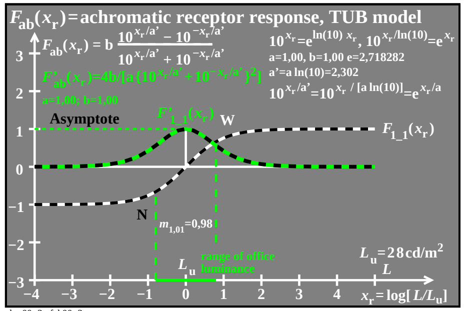
$$F_{abu}(x/a) = [\tanh(x/a)+1]\,/\,[\tanh(x_u/a)+1] \quad [1u]$$

$$F'_{abu}(x/a) = \tanh(x/a) \text{ with } \tanh(x_u/a)=0 \quad [2u]$$

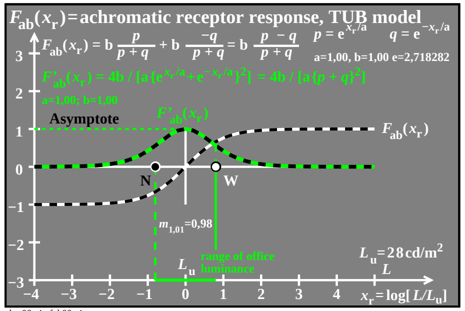
$$F'_{abu}(x/a) = \frac{v^2(x/a) - u^2(x/a)}{a\,v^2(x/a)} \quad [3u]$$

$$F'_{abu}(x/a) = \frac{4}{a\,[e^{x/a}+e^{-x/a}]^2} = \frac{1}{a\cosh^2(x/a)} \quad [4u]$$

her01−2n fek01−2n



her00−3n fek00−3n



her00−4n fek00−4n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

$$F_{ab}(x/a) = b\tanh(x/a) = b\frac{e^{x/a}-e^{-x/a}}{e^{x/a}+e^{-x/a}} = b\frac{u(x/a)}{v(x/a)} \quad [1]$$

$$F'_{ab}(x/a) = b\frac{u'(x/a)\,v(x/a) - u(x/a)\,v'(x/a)}{v^2(x/a)} \quad [2]$$

$$F'_{ab}(x/a) = b\frac{v^2(x/a) - u^2(x/a)}{a\,v^2(x/a)} \quad [3]$$

$$F'_{ab}(x/a) = \frac{4b}{a\,[e^{x/a}+e^{-x/a}]^2} = \frac{b}{a\cosh^2(x/a)} \quad [4]$$

her01−3n fek01−3n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

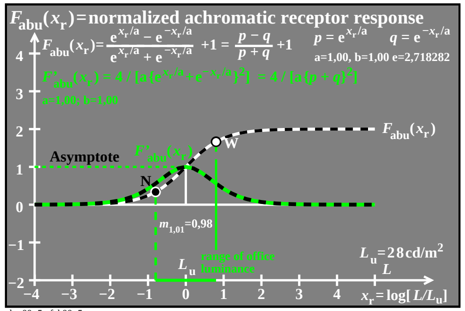
$$F_{abu}(x/a) = \tanh(x/a) = \frac{e^{x/a}-e^{-x/a}}{e^{x/a}+e^{-x/a}} = \frac{u(x/a)}{v(x/a)} \quad [1u]$$

$$F'_{abu}(x/a) = \frac{u'(x/a)\,v(x/a) - u(x/a)\,v'(x/a)}{v^2(x/a)} \quad [2u]$$

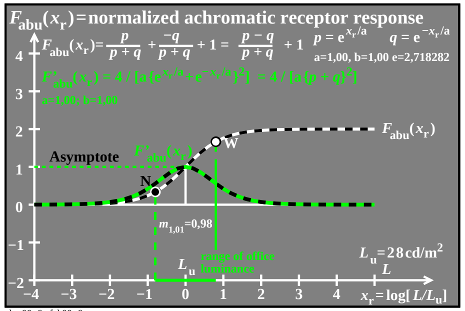
$$F'_{abu}(x/a) = \frac{v^2(x/a) - u^2(x/a)}{a\,v^2(x/a)} \quad [3u]$$

$$F'_{abu}(x/a) = \frac{4}{a\,[e^{x/a}+e^{-x/a}]^2} = \frac{1}{a\cosh^2(x/a)} \quad [4u]$$

her01−4n fek01−4n



her00−5n fek00−5n



her00−6n fek00−6n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

$$F_{ab}(x/a) = b\tanh(x/a) = b\frac{e^{x/a}-e^{-x/a}}{e^{x/a}+e^{-x/a}} \quad [1]$$

$$\frac{dF_{ab}(x/a)}{dx} = \frac{4b}{a[e^{x/a}+e^{-x/a}]^2} = \frac{b}{a\cosh^2(x/a)} \quad [4]$$

$$\frac{dF_{ab}(x_r/a)}{dx_r} = \frac{4b}{a[e^{x_r/a}+e^{-x_r/a}]^2} \quad x_r=\log(L/L_u) \quad dx_r/dL=\ln(10)/L \quad [5]$$

$$\frac{dF_{ab}(x_r/a)}{dx_r}\,\frac{dx_r}{dL} = \frac{4b}{a[e^{x_r/a}+e^{-x_r/a}]^2}\,\frac{\ln(10)}{L} \quad [6]$$

her01−5n fek01−5n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

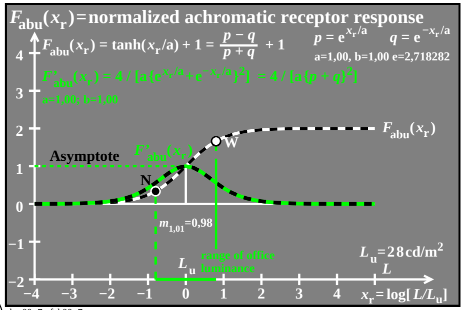
$$F_{abu}(x/a) = \tanh(x/a) = \frac{e^{x/a}-e^{-x/a}}{e^{x/a}+e^{-x/a}} \quad [1u]$$

$$\frac{dF_{abu}(x/a)}{dx} = \frac{4}{a[e^{x/a}+e^{-x/a}]^2} = \frac{1}{a\cosh^2(x/a)} \quad [4u]$$

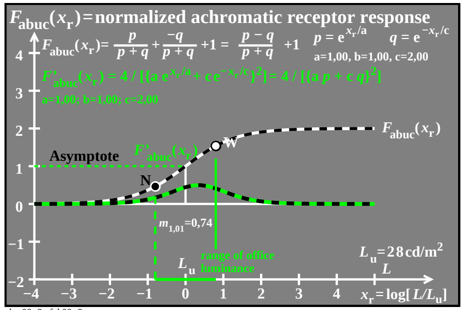
$$\frac{dF_{abu}(x_r/a)}{dx_r} = \frac{4}{a[e^{x_r/a}+e^{-x_r/a}]^2} \quad x_r=\log(L/L_u) \quad dx_r/dL=\ln(10)/L \quad [5u]$$

$$\frac{dF_{abu}(x_r/a)}{dx_r}\,\frac{dx_r}{dL} = \frac{4}{a[e^{x_r/a}+e^{-x_r/a}]^2}\,\frac{\ln(10)}{L} \quad [6u]$$

her01−6n fek01−6n



her00−7n fek00−7n



her00−8n fek00−8n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

$$F_{ab}(x_r/a) = b\tanh(x_r/a) = b\frac{e^{x_r/a}-e^{-x_r/a}}{e^{x_r/a}+e^{-x_r/a}} \quad [1]$$

$$\frac{dF_{ab}(x_r/a)}{dx_r} = \frac{4b}{a[e^{x_r/a}+e^{-x_r/a}]^2} \quad x_r=\log(L/L_u) \quad dx_r/dL=\ln(10)/L \quad [5]$$

$$\frac{dF_{ab}(x_r/a)}{dx_r}\,\frac{dx_r}{dL} = \frac{4b}{a[e^{x_r/a}+e^{-x_r/a}]^2}\,\frac{\ln(10)}{L} \quad [6]$$

$$\frac{L}{dL} = \frac{4b\ln(10)}{a[e^{x_r/a}+e^{-x_r/a}]^2} \quad dL = \frac{a[e^{x_r/a}+e^{-x_r/a}]^2 L}{4b\ln(10)} \quad [7]$$

her01−7n fek01−7n

Mathematical equations of hyperbolic functions

See: Handbook of mathematical functions, NBS, USA, Sec. 4.5

$$F_{abu}(x_r/a) = \tanh(x_r/a) = \frac{e^{x_r/a}-e^{-x_r/a}}{e^{x_r/a}+e^{-x_r/a}} \quad [1u]$$

$$\frac{dF_{abu}(x_r/a)}{dx_r} = \frac{4}{a[e^{x_r/a}+e^{-x_r/a}]^2} \quad x_r=\log(L/L_u) \quad dx_r/dL=\ln(10)/L \quad [5u]$$

$$\frac{dF_{abu}(x_r/a)}{dx_r}\,\frac{dx_r}{dL} = \frac{4}{a[e^{x_r/a}+e^{-x_r/a}]^2}\,\frac{\ln(10)}{L} \quad [6u]$$

$$\frac{L}{dL} = \frac{4\ln(10)}{a[e^{x_r/a}+e^{-x_r/a}]^2} \quad dL = \frac{a[e^{x_r/a}+e^{-x_r/a}]^2 L}{4\ln(10)} \quad [7u]$$

her01−8n fek01−8n

TUB registration: 20241201-her0/her0l0np.pdf /.ps
application for evaluation and measurement of display or print output

TUB material: code=rha4ta

TUB-test chart her0; Model of normalized response function $F_{ab}(x_r)$ and derivation $F'_{ab}(x_r)$
Mathematical calculation of the derivation $F'_{ab}(x_r)$, of the contrast $L/\Delta L$, and the discrimination ΔL