Line-element equations according to CIE 230:2019

Colour-threshold (t) function $f_t(Y_r) = \Delta Y_t = \Delta Y_r Y_u$ [0]

$\Delta Y_t = (A_1 + A_2 Y)/A_0$ A_0=1,5, A_1=0,0170, A_2=0,0058

$$f_{tu}(Y_r) = \frac{\Delta Y_t}{\Delta Y_{tu}} = \frac{1+b\,Y_r}{1+b} \quad b = A_2 Y_u / A_1 \quad Y_r = Y/Y_u \quad [1]$$

$$F_{tu}(Y_r) = \int \frac{f'_{tu}(Y_r)}{f_{tu}(Y_r)}\, dY_r = \int \frac{b}{1+b\,Y_r}\, dY_r \quad [2]$$

Example for $L^*_{tu}(Y_r)$, ΔY_t with $Y_{ru} = Y_r/Y_u = 1$, b=6,141:

$$L^*_{tu}(Y_r) = \frac{L^*_t(Y_r)}{L^*_t(Y_{ru})} = \frac{\ln(1+b\,Y_r)}{\ln(1+b)} \quad [3]$$

$$f_{tu}(Y_r) = \frac{\Delta Y_t}{\Delta Y_{tu}} = \frac{1+b\,Y_r}{1+b} \quad [4]$$