see similar technical theories: http://farbe.li.tu-berlin.de/hep/hep.htm
technical information: http://farbe.li.tu-berlin.de/hep/color.htm

http://farbe.li.tu-berlin.de/hep4/hep4l0n1.txt /.ps; only vector graphic VG; start output see separate images of this page: http://farbe.li.tu-berlin.de/hep4/hep4.htm

TUB registration: 20241201-hep4/hep4l0n1.txt /.ps
application for evaluation and presentation of display or print output
mail: code=tha

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=100 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
300	120°	22,969	0,0718	0,2448	34,60	99,99	3,75	79,99
300	100°	23,128	0,0747	0,2494	34,60	99,99	3,75	79,99
300	90°	23,415	0,1086	0,2526	35,53	99,99	3,99	75,07
300	60°	23,973	0,1313	0,2657	37,21	100,00	4,45	67,31
300	30°	26,235	0,1797	0,3188	40,48	99,99	5,42	55,33
300	20°	27,971	0,2013	0,3555	53,74	100,00	10,10	29,68
300	10°	30,747	0,2730	0,3984	63,91	99,99	14,37	20,86
67,01	120°	22,969	0,0718	0,2448	49,99U	125	79,99	67,01

Sep01-1a L_{ap}=300, L_{bp}=300, L_{dp}=1,00, L_{gp}=1,00, L_{rp}=1,00, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=300 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = s_d(\varphi)\frac{L_T}{L_a} - d_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31) \quad [2]$$
$$s_d(\varphi) = C_T(\varphi)\left[S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}\right] \quad d_d(L_a, \varphi) = B_d(L_a, \varphi) \quad [4] \quad (=\text{scaling factor})$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T	$s_d(\varphi)$ $d_d(L_a,\varphi)$
300	120°	22,969	0,0718	0,2448	34,60	99,99	3,75	79,99	100
300	100°	23,128	0,0747	0,2494	34,60	99,99	3,75	79,99	100
300	90°	23,415	0,1086	0,2526	35,53	99,99	3,99	75,07	100
300	60°	23,973	0,1313	0,2657	37,21	100,00	4,45	67,31	100
300	30°	26,235	0,1797	0,3188	40,48	99,99	5,42	55,33	100
300	20°	27,971	0,2013	0,3555	53,74	100,00	10,10	29,68	100
300	10°	30,747	0,2730	0,3984	63,91	99,99	14,37	20,86	100
53,1U	120°	22,969	0,0718	0,2448	34,60	50,00U	3,75	79,99	23,81

Sep01-1b L_{ap}=300, L_{bp}=300, L_{dp}=1,00, L_{gp}=1,00, L_{rp}=1,00, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=200 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = [C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi)]L_a^n \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31, L_{ad}^n{=}L_{aw}^n{=}2) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
300	120°	22,969	0,0718	0,2448	34,60	99,99	3,75	79,99
300	100°	23,128	0,0747	0,2494	34,60	99,99	3,75	79,99
300	90°	23,415	0,1086	0,2526	35,53	99,99	3,99	75,07
300	60°	23,973	0,1313	0,2657	37,21	100,00	4,45	67,31
300	30°	26,235	0,1797	0,3188	40,48	99,99	5,42	55,33
300	20°	27,971	0,2013	0,3555	53,74	100,00	10,10	29,68
300	10°	30,747	0,2730	0,3984	63,91	99,99	14,37	20,86
23,8U	120°	22,969	0,0718	0,2448	34,60	50,00U	3,75	79,99

Sep01-4b L_{ap}=300, L_{bp}=300, L_{dp}=1,00, L_{gp}=1,00, L_{rp}=1,00, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=200 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = s_d(\varphi)\frac{L_T}{L_a} - d_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31, L_{ad}^n{=}L_{aw}^n{=}2) \quad [2]$$
$$s_d(\varphi) = C_T(\varphi)\left[S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}\right] \quad d_d(L_a, \varphi) = B_d(L_a, \varphi) \quad [4] \quad (=\text{scaling factor})$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T	$s_d(\varphi)$ $d_d(L_a,\varphi)$
300	120°	22,969	0,0718	0,2448	34,60	99,99	3,75	79,99	100
300	100°	23,128	0,0747	0,2494	34,60	99,99	3,75	79,99	100
300	90°	23,415	0,1086	0,2526	35,53	99,99	3,99	75,07	100
300	60°	23,973	0,1313	0,2657	37,21	100,00	4,45	67,31	100
300	30°	26,235	0,1797	0,3188	40,48	99,99	5,42	55,33	100
300	20°	27,971	0,2013	0,3555	53,74	100,00	10,10	29,68	100
300	10°	30,747	0,2730	0,3984	63,91	99,99	14,37	20,86	100
45,0U	120°	22,969	0,0718	0,2448	34,60	50,00U	3,75	79,99	45,00

Sep01-3b L_{ap}=300, L_{bp}=300, L_{dp}=1,00, L_{gp}=1,00, L_{rp}=1,00, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=200 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = [C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi)]L_a^n \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31, L_{ad}^n{=}L_{aw}^n{=}2) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
300	120°	22,969	0,0718	0,2448	34,60	99,99	3,75	79,99
300	100°	23,128	0,0747	0,2494	34,60	99,99	3,75	79,99
300	90°	23,415	0,1086	0,2526	35,53	99,99	3,99	75,07
300	60°	23,973	0,1313	0,2657	37,21	100,00	4,45	67,31
300	30°	26,235	0,1797	0,3188	40,48	99,99	5,42	55,33
300	20°	27,971	0,2013	0,3555	53,74	100,00	10,10	29,68
300	10°	30,747	0,2730	0,3984	63,91	99,99	14,37	20,86
53,1U	120°	22,969	0,0718	0,2448	34,60	50,00U	3,75	79,99

Sep01-3a L_{ap}=300, L_{bp}=300, L_{dp}=1,00, L_{gp}=1,00, L_{rp}=1,00, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=200 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = s_d(\varphi)\frac{L_T}{L_a} - d_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31, L_{ad}^n{=}L_{aw}^n{=}2) \quad [2]$$
$$s_d(\varphi) = C_T(\varphi)\left[S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}\right] \quad d_d(L_a, \varphi) = B_d(L_a, \varphi) \quad [4] \quad (=\text{scaling factor})$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T	$s_d(\varphi)$ $d_d(L_a,\varphi)$
300	120°	22,969	0,0718	0,2448	34,60	99,99	3,75	79,99	100
300	100°	23,128	0,0747	0,2494	34,60	99,99	3,75	79,99	100
300	90°	23,415	0,1086	0,2526	35,53	99,99	3,99	75,07	100
300	60°	23,973	0,1313	0,2657	37,21	100,00	4,45	67,31	100
300	30°	26,235	0,1797	0,3188	40,48	99,99	5,42	55,33	100
300	20°	27,971	0,2013	0,3555	53,74	100,00	10,10	29,68	100
300	10°	30,747	0,2730	0,3984	63,91	99,99	14,37	20,86	100
45,0U	120°	22,969	0,0718	0,2448	34,60	50,00U	2,89	78,36	45,00

Sep01-3c L_{ap}=200, L_{bp}=300, L_{dp}=0,66, L_{gp}=0,88, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=200 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = [C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi)]L_a^n \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31, L_{ad}^n{=}L_{aw}^n{=}1{,}2) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
300	120°	22,969	0,0718	0,2448	34,60	99,99	3,75	79,99
300	100°	23,128	0,0747	0,2494	34,60	99,99	3,75	79,99
300	90°	23,415	0,1086	0,2526	35,53	99,99	3,99	75,07
300	60°	23,973	0,1313	0,2657	37,21	100,00	4,45	67,31
300	30°	26,235	0,1797	0,3188	40,48	99,99	5,42	55,33
300	20°	27,971	0,2013	0,3555	53,74	100,00	10,10	29,68
300	10°	30,747	0,2730	0,3984	63,91	99,99	14,37	20,86
92,9U	120°	22,969	0,0718	0,2448	49,51	50,00U	8,20	83,94

Sep01-3d L_{ap}=300, L_{bp}=300, L_{dp}=1,00, L_{gp}=1,00, L_{rp}=1,00, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=100 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
1000	120°	22,969	0,0718	0,2448	49,51	100,00	11,91	83,94
1000	100°	23,128	0,0747	0,2494	50,82	146,62	12,68	78,86
1000	90°	23,415	0,1086	0,2526	52,89	100,00	13,85	72,19
1000	60°	23,973	0,1313	0,2657	57,37	146,66	15,98	62,61
1000	30°	26,235	0,1797	0,3188	75,92	147,37	30,80	32,46
1000	20°	27,971	0,2013	0,3555	90,28	147,78	43,81	22,82
1000	10°	30,747	0,2730	0,3984	112,66	149,63	65,96	15,16
221,4U	120°	22,969	0,0718	0,2448	49,51	72,99U	11,91	83,94

Sep01-5a L_{ap}=1000, L_{bp}=300, L_{dp}=3,33, L_{gp}=1,45, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=1000 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = s_d(\varphi)\frac{L_T}{L_a} - d_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31) \quad [2]$$
$$s_d(\varphi) = C_T(\varphi)\left[S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}\right] \quad d_d(L_a, \varphi) = B_d(L_a, \varphi) \quad [4] \quad (=\text{scaling factor})$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T	$s_d(\varphi)$ $d_d(L_a,\varphi)$
1000	120°	22,969	0,0718	0,2448	49,51	100,00	11,91	83,94	100
1000	100°	23,128	0,0747	0,2494	50,82	146,62	12,68	78,86	100
1000	90°	23,415	0,1086	0,2526	52,89	100,00	13,85	72,19	100
1000	60°	23,973	0,1313	0,2657	57,37	146,66	15,98	62,61	100
1000	30°	26,235	0,1797	0,3188	75,92	147,37	30,80	32,46	100
1000	20°	27,971	0,2013	0,3555	90,28	147,78	43,81	22,82	100
1000	10°	30,747	0,2730	0,3984	112,66	149,63	65,96	15,16	100
221,4U	120°	22,969	0,0718	0,2448	49,51	72,99U	11,91	83,94	221,43

Sep01-5b L_{ap}=1000, L_{bp}=300, L_{dp}=3,33, L_{gp}=1,45, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=40 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
40	120°	22,969	0,0718	0,2448	19,29	92,57	0,56	70,18
40	100°	23,128	0,0747	0,2494	19,83	52,74	0,60	65,70
40	90°	23,415	0,1086	0,2526	21,10	55,89	0,64	59,21
40	60°	23,973	0,1313	0,2657	23,14	52,08	0,89	44,82
40	30°	26,235	0,1797	0,3188	30,96	51,35	1,70	23,42
40	20°	27,971	0,2013	0,3555	36,83	50,93	2,43	16,45
40	10°	30,747	0,2730	0,3984	46,83	49,64	3,99	12,00
9,1U	120°	22,969	0,0718	0,2448	19,29	26,38U	0,56	70,18

Sep01-5c L_{ap}=40, L_{bp}=300, L_{dp}=0,13, L_{gp}=0,55, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=40 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = s_d(\varphi)\frac{L_T}{L_a} - d_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31) \quad [2]$$
$$s_d(\varphi) = C_T(\varphi)\left[S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}\right] \quad d_d(L_a, \varphi) = B_d(L_a, \varphi) \quad [4] \quad (=\text{scaling factor})$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T	$s_d(\varphi)$ $d_d(L_a,\varphi)$
40	120°	22,969	0,0718	0,2448	19,29	92,57	0,56	70,18	100
40	100°	23,128	0,0747	0,2494	19,83	52,74	0,60	65,70	100
40	90°	23,415	0,1086	0,2526	21,10	55,89	0,64	59,21	100
40	60°	23,973	0,1313	0,2657	23,14	52,08	0,89	44,82	100
40	30°	26,235	0,1797	0,3188	30,96	51,35	1,70	23,42	100
40	20°	27,971	0,2013	0,3555	36,83	50,93	2,43	16,45	100
40	10°	30,747	0,2730	0,3984	46,83	49,64	3,99	12,00	100
9,1U	120°	22,969	0,0718	0,2448	19,29	26,38U	0,56	70,18	9,1U

Sep01-5d L_{ap}=40, L_{bp}=300, L_{dp}=0,13, L_{gp}=0,55, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=200 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = [C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi)]L_a^n \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31, L_{ad}^n{=}L_{aw}^n{=}2) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
300	120°	22,969	0,0718	0,2448	19,29	98,56	1,06	70,18
300	100°	23,128	0,0747	0,2494	19,83	98,49	1,13	65,70
300	90°	23,415	0,1086	0,2526	21,10	97,73	1,33	55,89
300	60°	23,973	0,1313	0,2657	23,14	97,26	1,66	44,82
300	30°	26,235	0,1797	0,3188	30,96	99,38	3,18	23,42
300	20°	27,971	0,2013	0,3555	36,83	95,11	4,54	16,45
300	10°	30,747	0,2730	0,3984	46,83	92,71	7,25	10,29
26,4U	120°	22,969	0,0718	0,2448	19,29	50,00U	1,06	70,18

Sep01-5e L_{ap}=200, L_{bp}=300, L_{dp}=0,66, L_{gp}=0,88, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=100 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
1000	120°	22,969	0,0718	0,2448	49,51	100,00	11,91	34,08
1000	100°	23,128	0,0747	0,2494	50,82	146,62	12,68	32,02
1000	90°	23,415	0,1086	0,2526	52,89	100,00	13,85	29,31
1000	60°	23,973	0,1313	0,2657	57,37	146,66	15,98	25,42
1000	30°	26,235	0,1797	0,3188	75,92	147,37	30,80	13,18
1000	20°	27,971	0,2013	0,3555	90,28	147,78	43,81	9,26
1000	10°	30,747	0,2730	0,3984	112,66	149,63	65,96	6,15
48,0U	120°	22,969	0,0718	0,2448	49,51	50,00U	15,81	34,08

Sep01-5f L_{ap}=1000, L_{bp}=300, L_{dp}=3,33, L_{gp}=1,45, 0° ↔ φ= 120°

Relationship brightness B^*_{Ty} and luminance L_T as function of viewing angle φ for test equal adaptation luminance L_a=40 cd/m²

$$B^*_{Ty}(L_T, L_a, \varphi) = C_T(\varphi)\frac{L_T}{L_a} - B_d(L_a, \varphi) \quad \text{brightness } B^*_{Ty} \quad [1]$$
$$B_d(L_a, \varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (n{=}0{,}31, L_{ad}^n{=}L_{aw}^n{=}1{,}2) \quad [2]$$
$$L_T(L_a, \varphi) = [S_d(\varphi) + S_T(\varphi)\frac{L_a^n}{1}]^{\frac{1}{n}} \quad (=\text{black threshold}) \quad [3]$$
$$S_T(\varphi) = C_T(\varphi)[S_d(\varphi) + S_T(\varphi)L_a^n] \quad (=\text{scaling factor}) \quad [4]$$

L_T	φ	$C_T(\varphi)$	$S_d(\varphi)$	$S_T(\varphi)$	$B_d(L_a,\varphi)$	B^*_{Ty}	L_{Ld}	L_d/L_T
40	120°	22,969	0,0718	0,2448	19,29	98,56	0,56	48,18
40	100°	23,128	0,0747	0,2494	19,83	98,49	0,60	45,09
40	90°	23,415	0,1086	0,2526	21,10	97,73	0,64	40,64
40	60°	23,973	0,1313	0,2657	23,14	97,26	0,89	30,76
40	30°	26,235	0,1797	0,3188	30,96	99,38	1,70	16,08
40	20°	27,971	0,2013	0,3555	36,83	95,11	2,43	11,29
40	10°	30,747	0,2730	0,3984	46,83	92,71	3,99	8,24
9,4U	120°	22,969	0,0718	0,2448	19,29	50,00U	0,56	48,18

Sep01-5g L_{ap}=40, L_{bp}=300, L_{dp}=0,13, L_{gp}=0,55, 0° ↔ φ= 120°

TUB-test chart hep4; HAULAB, scaling of achromatic colours in white surround of 180 degree, *Haubner* (1980), Adaptations L_{wa}=300, 1000, 200 & 40cd/m²; 7 viewing angles 120° to 10°