

Eye sensitivity functions and color matching functions

Data provided below:

CIE 1931 eye sensitivity function $V(\lambda)$ in the photopic vision regime

CIE 1978 eye sensitivity function $V(\lambda)$ in the photopic vision regime

CIE 1951 eye sensitivity function $V(\lambda)$ in the scotopic vision regime

CIE 1931 color matching functions \bar{x} , \bar{y} , \bar{z} where $\bar{y} = V(\lambda)$

Note:

The eye sensitivity function is also called luminosity function

Photopic = vision in bright light that is mediated by the cones of the retina

Scotopic = vision in dim light which involves only the retinal rods as light receptors

References:

CIE (Commission Internationale de l'Éclairage or International Commission on Illumination)

Web site: < <http://www.cie.co.at/cie/home.html> >

Color & Vision Research Laboratories, London (UK) and Tübingen (Germany) (2003)

Web site: < <http://cvision.ucsd.edu/> >

CIE 1931 eye sensitivity function $V(\lambda)$ in the photopic vision regime

360	3.9E-06
365	7E-06
370	1.2E-05
375	2.2E-05
380	3.9E-05
385	6.4E-05
390	0.00012
395	0.00022
400	0.0004
405	0.00064
410	0.00121
415	0.00218
420	0.004
425	0.0073
430	0.0116
435	0.01684
440	0.023
445	0.0298
450	0.038
455	0.048
460	0.06
465	0.0739
470	0.09098
475	0.1126
480	0.13902
485	0.1693
490	0.20802
495	0.2586
500	0.323
505	0.4073
510	0.503
515	0.6082
520	0.71
525	0.7932
530	0.862

535	0.91485
540	0.954
545	0.9803
550	0.99495
555	1
560	0.995
565	0.9786
570	0.952
575	0.9154
580	0.87
585	0.8163
590	0.757
595	0.6949
600	0.631
605	0.5668
610	0.503
615	0.4412
620	0.381
625	0.321
630	0.265
635	0.217
640	0.175
645	0.1382
650	0.107
655	0.0816
660	0.061
665	0.04458
670	0.032
675	0.0232
680	0.017
685	0.01192
690	0.00821
695	0.00572
700	0.0041
705	0.00293
710	0.00209
715	0.00148
720	0.00105
725	0.00074
730	0.00052
735	0.00036
740	0.00025
745	0.00017
750	0.00012
755	8.5E-05
760	0.00006
765	4.2E-05
770	0.00003
775	2.1E-05
780	1.5E-05
785	1.1E-05
790	7.5E-06
795	5.3E-06
800	3.7E-06
805	2.6E-06
810	1.8E-06

815	1.3E-06
820	9.1E-07
825	6.4E-07
830	4.5E-07

CIE 1978 eye sensitivity function $V(\lambda)$ in the photopic vision regime

380	2.00000e-004
385	3.95560e-004
390	8.00000e-004
395	1.54570e-003
400	2.80000e-003
405	4.65620e-003
410	7.40000e-003
415	1.17790e-002
420	1.75000e-002
425	2.26780e-002
430	2.73000e-002
435	3.25840e-002
440	3.79000e-002
445	4.23910e-002
450	4.68000e-002
455	5.21220e-002
460	6.00000e-002
465	7.29420e-002
470	9.09800e-002
475	1.12840e-001
480	1.39020e-001
485	1.69870e-001
490	2.08020e-001
495	2.58080e-001
500	3.23000e-001
505	4.05400e-001
510	5.03000e-001
515	6.08110e-001
520	7.10000e-001
525	7.95100e-001
530	8.62000e-001
535	9.15050e-001
540	9.54000e-001
545	9.80040e-001
550	9.94950e-001
555	1.00010e+000
560	9.95000e-001
565	9.78750e-001
570	9.52000e-001
575	9.15580e-001
580	8.70000e-001
585	8.16230e-001
590	7.57000e-001
595	6.94830e-001
600	6.31000e-001
605	5.66540e-001
610	5.03000e-001
615	4.41720e-001
620	3.81000e-001
625	3.20520e-001

630	2.65000e-001
635	2.17020e-001
640	1.75000e-001
645	1.38120e-001
650	1.07000e-001
655	8.16520e-002
660	6.10000e-002
665	4.43270e-002
670	3.20000e-002
675	2.34540e-002
680	1.70000e-002
685	1.18720e-002
690	8.21000e-003
695	5.77230e-003
700	4.10200e-003
705	2.92910e-003
710	2.09100e-003
715	1.48220e-003
720	1.04700e-003
725	7.40150e-004
730	5.20000e-004
735	3.60930e-004
740	2.49200e-004
745	1.72310e-004
750	1.20000e-004
755	8.46200e-005
760	6.00000e-005
765	4.24460e-005
770	3.00000e-005
775	2.12100e-005
780	1.49890e-005
785	1.05840e-005
790	7.46560e-006
795	5.25920e-006
800	3.70280e-006
805	2.60760e-006
810	1.83650e-006
815	1.29500e-006
820	9.10920e-007
825	6.35640e-007

CIE 1951 eye sensitivity function $V(\lambda)$ in the scotopic vision regime

380	5.890e-004
385	1.108e-003
390	2.209e-003
395	4.530e-003
400	9.290e-003
405	1.852e-002
410	3.484e-002
415	6.040e-002
420	9.660e-002
425	1.436e-001
430	1.998e-001
435	2.625e-001
440	3.281e-001
445	3.931e-001

450	4.550e-001
455	5.130e-001
460	5.670e-001
465	6.200e-001
470	6.760e-001
475	7.340e-001
480	7.930e-001
485	8.510e-001
490	9.040e-001
495	9.490e-001
500	9.820e-001
505	9.980e-001
510	9.970e-001
515	9.750e-001
520	9.350e-001
525	8.800e-001
530	8.110e-001
535	7.330e-001
540	6.500e-001
545	5.640e-001
550	4.810e-001
555	4.020e-001
560	3.288e-001
565	2.639e-001
570	2.076e-001
575	1.602e-001
580	1.212e-001
585	8.990e-002
590	6.550e-002
595	4.690e-002
600	3.315e-002
605	2.312e-002
610	1.593e-002
615	1.088e-002
620	7.370e-003
625	4.970e-003
630	3.335e-003
635	2.235e-003
640	1.497e-003
645	1.005e-003
650	6.770e-004
655	4.590e-004
660	3.129e-004
665	2.146e-004
670	1.480e-004
675	1.026e-004
680	7.150e-005
685	5.010e-005
690	3.533e-005
695	2.501e-005
700	1.780e-005
705	1.273e-005
710	9.140e-006
715	6.600e-006
720	4.780e-006
725	3.482e-006

730	2.546e-006
735	1.870e-006
740	1.379e-006
745	1.022e-006
750	7.600e-007
755	5.670e-007
760	4.250e-007
765	3.196e-007
770	2.413e-007
775	1.829e-007
780	1.390e-007

CIE 1931 color matching functions \bar{x} , \bar{y} , \bar{z} where $\bar{y} = V(\lambda)$

360	0.000129900000	0.000003917000	0.000606100000
365	0.000232100000	0.000006965000	0.001086000000
370	0.000414900000	0.000012390000	0.001946000000
375	0.000741600000	0.000022020000	0.003486000000
380	0.001368000000	0.000039000000	0.006450001000
385	0.002236000000	0.000064000000	0.010549990000
390	0.004243000000	0.000120000000	0.020050010000
395	0.007650000000	0.000217000000	0.036210000000
400	0.014310000000	0.000396000000	0.067850010000
405	0.023190000000	0.000640000000	0.110200000000
410	0.043510000000	0.001210000000	0.207400000000
415	0.077630000000	0.002180000000	0.371300000000
420	0.134380000000	0.004000000000	0.645600000000
425	0.214770000000	0.007300000000	1.039050100000
430	0.283900000000	0.011600000000	1.385600000000
435	0.328500000000	0.016840000000	1.622960000000
440	0.348280000000	0.023000000000	1.747060000000
445	0.348060000000	0.029800000000	1.782600000000
450	0.336200000000	0.038000000000	1.772110000000
455	0.318700000000	0.048000000000	1.744100000000
460	0.290800000000	0.060000000000	1.669200000000
465	0.251100000000	0.073900000000	1.528100000000
470	0.195360000000	0.090980000000	1.287640000000
475	0.142100000000	0.112600000000	1.041900000000
480	0.095640000000	0.139020000000	0.812950100000
485	0.057950010000	0.169300000000	0.616200000000
490	0.032010000000	0.208020000000	0.465180000000
495	0.014700000000	0.258600000000	0.353300000000
500	0.004900000000	0.323000000000	0.272000000000
505	0.002400000000	0.407300000000	0.212300000000
510	0.009300000000	0.503000000000	0.158200000000
515	0.029100000000	0.608200000000	0.111700000000
520	0.063270000000	0.710000000000	0.078249990000
525	0.109600000000	0.793200000000	0.057250010000
530	0.165500000000	0.862000000000	0.042160000000
535	0.225749900000	0.914850100000	0.029840000000
540	0.290400000000	0.954000000000	0.020300000000
545	0.359700000000	0.980300000000	0.013400000000
550	0.433449900000	0.994950100000	0.008749999000
555	0.512050100000	1.000000000000	0.005749999000
560	0.594500000000	0.995000000000	0.003900000000
565	0.678400000000	0.978600000000	0.002749999000

570	0.762100000000	0.952000000000	0.002100000000
575	0.842500000000	0.915400000000	0.001800000000
580	0.916300000000	0.870000000000	0.001650001000
585	0.978600000000	0.816300000000	0.001400000000
590	1.026300000000	0.757000000000	0.001100000000
595	1.056700000000	0.694900000000	0.001000000000
600	1.062200000000	0.631000000000	0.000800000000
605	1.045600000000	0.566800000000	0.000600000000
610	1.002600000000	0.503000000000	0.000340000000
615	0.938400000000	0.441200000000	0.000240000000
620	0.854449900000	0.381000000000	0.000190000000
625	0.751400000000	0.321000000000	0.000100000000
630	0.642400000000	0.265000000000	0.000049999990
635	0.541900000000	0.217000000000	0.000030000000
640	0.447900000000	0.175000000000	0.000020000000
645	0.360800000000	0.138200000000	0.000010000000
650	0.283500000000	0.107000000000	0.000000000000
655	0.218700000000	0.081600000000	0.000000000000
660	0.164900000000	0.061000000000	0.000000000000
665	0.121200000000	0.044580000000	0.000000000000
670	0.087400000000	0.032000000000	0.000000000000
675	0.063600000000	0.023200000000	0.000000000000
680	0.046770000000	0.017000000000	0.000000000000
685	0.032900000000	0.011920000000	0.000000000000
690	0.022700000000	0.008210000000	0.000000000000
695	0.015840000000	0.005723000000	0.000000000000
700	0.011359160000	0.004102000000	0.000000000000
705	0.008110916000	0.002929000000	0.000000000000
710	0.005790346000	0.002091000000	0.000000000000
715	0.004106457000	0.001484000000	0.000000000000
720	0.002899327000	0.001047000000	0.000000000000
725	0.002049190000	0.000740000000	0.000000000000
730	0.001439971000	0.000520000000	0.000000000000
735	0.000999949300	0.000361100000	0.000000000000
740	0.000690078600	0.000249200000	0.000000000000
745	0.000476021300	0.000171900000	0.000000000000
750	0.000332301100	0.000120000000	0.000000000000
755	0.000234826100	0.000084800000	0.000000000000
760	0.000166150500	0.000060000000	0.000000000000
765	0.000117413000	0.000042400000	0.000000000000
770	0.000083075270	0.000030000000	0.000000000000
775	0.000058706520	0.000021200000	0.000000000000
780	0.000041509940	0.000014990000	0.000000000000
785	0.000029353260	0.000010600000	0.000000000000
790	0.000020673830	0.000007465700	0.000000000000
795	0.000014559770	0.000005257800	0.000000000000
800	0.000010253980	0.000003702900	0.000000000000
805	0.000007221456	0.000002607800	0.000000000000
810	0.000005085868	0.000001836600	0.000000000000
815	0.000003581652	0.000001293400	0.000000000000
820	0.000002522525	0.000000910930	0.000000000000
825	0.000001776509	0.000000641530	0.000000000000
830	0.000001251141	0.000000451810	0.000000000000