



中华人民共和国气象行业标准

QX/T 368—2016

太阳常数和零大气质量下太阳光谱辐照度

Solar constant and solar spectral irradiance under zero air mass

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前 言

本标准按照 GB/T 1.1—2009 给出的规则起草。

本标准由全国气候与气候变化标准化技术委员会风能太阳能气候资源分技术委员会(SAC/TC 540/SC 2) 提出并归口。

本标准起草单位:中国气象局公共气象服务中心、中国气象科学研究院。

本标准主要起草人:申彦波、王炳忠、赵东、乔亚茹。

引 言

太阳常数和光谱辐照度是地面太阳辐射测量与计算的基础数据,是辐射传输模式的必要输入参数,在大气科学、空间科学、地理科学以及航天领域均有广泛应用。

我国目前采用的太阳常数是 1981 年世界气象组织(WMO)发布的 $1367 \text{ W/m}^2 \pm 7 \text{ W/m}^2$,太阳辐照度的光谱范围为 $0.25 \mu\text{m} \sim 25 \mu\text{m}$,与近年来的技术发展相比,该值不确定度大、光谱范围较窄、光谱分辨率较低,有欠精细。

本标准参考美国材料与试验协会(American Society for Testing and Materials,简称为 ASTM)2006 年发布的太阳常数和零大气质量下太阳光谱辐照度表(ASTM E490-00a:2006 Solar Constant and Zero Air Mass Solar Spectral Irradiance Tables),对太阳常数和零大气质量下太阳光谱辐照度进行更新。其中太阳常数是对 1978—1998 年期间 6 个不同卫星使用腔体式绝对辐射表测量的日平均值进行再平均计算得到,零大气质量下的光谱辐照度基于卫星、航天飞机、高空飞机、火箭、地面太阳望远镜以及模拟的光谱辐射度数据分析获得。

本标准可作为气象行业在进行太阳辐射相关测量与模式计算时的基础数据,同时亦可作为空间科学和航天领域的参考。

太阳常数和零大气质量下太阳光谱辐照度

1 范围

本标准给出了太阳常数和零大气质量下太阳光谱辐照度。

本标准适用于与太阳辐射有关的测量和模式计算。对于空间科学领域的热分析与热平衡测试,以及航天领域相关部件和材料的测试等,可参照使用。

2 术语和定义

下列术语和定义适用于本文件。

2.1

太阳常数 solar constant

大气层外日地平均距离处(1个天文单位),以法向入射到平面上的总太阳辐照度。

2.2

天文单位 astronomical unit

用于表示日地之间平均距离的长度单位。

注:天文单位的符号为 AU, $1 \text{ AU} = 149597890 \text{ km} \pm 500 \text{ km}$ 。

2.3

大气质量 air mass

大气光学质量 optical air mass

AM

太阳辐射以任意给定的角度(Z)通过大气到达海平面的路径长度(l_m)与从天顶到达海平面的路径长度(l_z)之比。

注:AM的计算公式为 $AM = l_m/l_z \cong \sec Z$, $Z \leq 62^\circ$ 。

2.4

零大气质量 zero air mass

AM0

在距离太阳1个天文单位处,对太阳辐照度无大气衰减时的状态。

2.5

辐照度 irradiance

E

物体在单位时间、单位面积上接收到的辐射能。

注:辐照度的测量单位为瓦[特]每平方米($\text{W} \cdot \text{m}^{-2}$)。

[GB/T 31163—2014,定义 7.3]

2.6

光谱辐照度 spectral irradiance

单色辐照度

E_λ

给定波长 λ 下每单位波长间隔的辐照度,或作为波长的函数的辐照度。

注:单位是瓦[特]每平方米微米($\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$)。

3 符号

下列符号适用于本文件。

λ —— 波长,单位为微米(μm)。

E_λ —— 以 λ 为中心的小波段间隔范围内的光谱辐照度,单位为瓦每平方米微米($\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$)。

$E_{0-\lambda}$ —— 波长在 $0 \sim \lambda$ 范围内的总光谱辐照度,单位为瓦每平方米($\text{W} \cdot \text{m}^{-2}$)。

$D_{0-\lambda}$ —— $E_{0-\lambda}$ 占太阳常数($1366.1 \text{ W} \cdot \text{m}^{-2}$)的百分比,单位为%。

4 太阳常数

太阳常数为 $1366.1 \text{ W} \cdot \text{m}^{-2}$,该值的标准偏差是 4.25×10^{-4} ,即 0.0425% 。关于太阳常数的单位换算参见附录 A。

5 零大气质量下太阳光谱辐照度

零大气质量下波长在 $0.1195 \mu\text{m} \sim 1000 \mu\text{m}$ 的太阳光谱辐照度如表 1 所示。表 1 中以双实线隔开的不同波长间隔。

表 1 零大气质量下太阳光谱辐照度

$\lambda/\mu\text{m}$	$E_\lambda/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.1195	6.185×10^{-2}	0.0	0.0
0.1205	0.5614	3.12×10^{-4}	2.28×10^{-5}
0.1215	4.901	3.04×10^{-3}	2.23×10^{-4}
0.1225	1.184	6.09×10^{-3}	4.45×10^{-4}
0.1235	4.770×10^{-2}	6.70×10^{-3}	4.91×10^{-4}
0.1245	3.433×10^{-2}	6.74×10^{-3}	4.94×10^{-4}
0.1255	2.882×10^{-2}	6.77×10^{-3}	4.96×10^{-4}
0.1265	3.523×10^{-2}	6.81×10^{-3}	4.98×10^{-4}
0.1275	2.127×10^{-2}	6.83×10^{-3}	5.00×10^{-4}
0.1285	1.727×10^{-2}	6.85×10^{-3}	5.02×10^{-4}
0.1295	3.994×10^{-2}	6.88×10^{-3}	5.04×10^{-4}
0.1305	0.1206	6.96×10^{-3}	5.10×10^{-4}
0.1315	3.983×10^{-2}	7.04×10^{-3}	5.16×10^{-4}
0.1325	4.126×10^{-2}	7.08×10^{-3}	5.19×10^{-4}
0.1335	0.1680	7.19×10^{-3}	5.26×10^{-4}
0.1345	4.572×10^{-2}	7.29×10^{-3}	5.34×10^{-4}

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.1355	3.802×10^{-2}	7.34×10^{-3}	5.37×10^{-4}
0.1365	3.094×10^{-2}	7.37×10^{-3}	5.40×10^{-4}
0.1375	2.920×10^{-2}	7.40×10^{-3}	5.42×10^{-4}
0.1385	3.968×10^{-2}	7.44×10^{-3}	5.44×10^{-4}
0.1395	7.562×10^{-2}	7.49×10^{-3}	5.49×10^{-4}
0.1405	6.075×10^{-2}	7.56×10^{-3}	5.54×10^{-4}
0.1415	4.207×10^{-2}	7.61×10^{-3}	5.57×10^{-4}
0.1425	4.683×10^{-2}	7.66×10^{-3}	5.61×10^{-4}
0.1435	5.110×10^{-2}	7.71×10^{-3}	5.64×10^{-4}
0.1445	5.093×10^{-2}	7.76×10^{-3}	5.68×10^{-4}
0.1455	5.535×10^{-2}	7.81×10^{-3}	5.72×10^{-4}
0.1465	7.087×10^{-2}	7.87×10^{-3}	5.76×10^{-4}
0.1475	8.485×10^{-2}	7.95×10^{-3}	5.82×10^{-4}
0.1485	8.199×10^{-2}	8.03×10^{-3}	5.88×10^{-4}
0.1495	7.956×10^{-2}	8.12×10^{-3}	5.94×10^{-4}
0.1505	8.697×10^{-2}	8.20×10^{-3}	6.00×10^{-4}
0.1515	9.266×10^{-2}	8.29×10^{-3}	6.07×10^{-4}
0.1525	0.1163	8.39×10^{-3}	6.14×10^{-4}
0.1535	0.1299	8.52×10^{-3}	6.23×10^{-4}
0.1545	0.2059	8.68×10^{-3}	6.36×10^{-4}
0.1555	0.2144	8.89×10^{-3}	6.51×10^{-4}
0.1565	0.1847	9.09×10^{-3}	6.66×10^{-4}
0.1575	0.1717	9.27×10^{-3}	6.79×10^{-4}
0.1585	0.1675	9.44×10^{-3}	6.91×10^{-4}
0.1595	0.1754	9.61×10^{-3}	7.04×10^{-4}
0.1605	0.1934	9.80×10^{-3}	7.17×10^{-4}
0.1615	0.2228	1.00×10^{-2}	7.32×10^{-4}
0.1625	0.2519	1.02×10^{-2}	7.50×10^{-4}
0.1635	0.2841	1.05×10^{-2}	7.69×10^{-4}
0.1645	0.2973	1.08×10^{-2}	7.91×10^{-4}
0.1655	0.4302	1.12×10^{-2}	8.17×10^{-4}
0.1665	0.3989	1.16×10^{-2}	8.48×10^{-4}
0.1675	0.3875	1.20×10^{-2}	8.76×10^{-4}
0.1685	0.4556	1.24×10^{-2}	9.07×10^{-4}

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.1695	0.5877	1.29×10^{-2}	9.46×10^{-4}
0.1705	0.6616	1.35×10^{-2}	9.91×10^{-4}
0.1715	0.688	1.42×10^{-2}	1.04×10^{-3}
0.1725	0.7252	1.49×10^{-2}	1.09×10^{-3}
0.1735	0.7645	1.57×10^{-2}	1.15×10^{-3}
0.1745	0.9067	1.65×10^{-2}	1.21×10^{-3}
0.1755	1.079	1.75×10^{-2}	1.28×10^{-3}
0.1765	1.220	1.86×10^{-2}	1.36×10^{-3}
0.1775	1.403	2.00×10^{-2}	1.46×10^{-3}
0.1785	1.538	2.14×10^{-2}	1.57×10^{-3}
0.1795	1.576	2.30×10^{-2}	1.68×10^{-3}
0.1805	1.831	2.47×10^{-2}	1.81×10^{-3}
0.1815	2.233	2.67×10^{-2}	1.96×10^{-3}
0.1825	2.243	2.90×10^{-2}	2.12×10^{-3}
0.1835	2.244	3.12×10^{-2}	2.28×10^{-3}
0.1845	2.066	3.34×10^{-2}	2.44×10^{-3}
0.1855	2.311	3.55×10^{-2}	2.60×10^{-3}
0.1865	2.700	3.81×10^{-2}	2.79×10^{-3}
0.1875	3.009	4.09×10^{-2}	2.99×10^{-3}
0.1885	3.291	4.41×10^{-2}	3.22×10^{-3}
0.1895	3.569	4.75×10^{-2}	3.48×10^{-3}
0.1905	3.764	5.12×10^{-2}	3.74×10^{-3}
0.1915	4.165	5.51×10^{-2}	4.03×10^{-3}
0.1925	4.113	5.93×10^{-2}	4.34×10^{-3}
0.1935	3.808	6.32×10^{-2}	4.63×10^{-3}
0.1945	5.210	6.77×10^{-2}	4.96×10^{-3}
0.1955	5.427	7.30×10^{-2}	5.35×10^{-3}
0.1965	6.008	7.88×10^{-2}	5.77×10^{-3}
0.1975	6.191	8.49×10^{-2}	6.21×10^{-3}
0.1985	6.187	9.10×10^{-2}	6.66×10^{-3}
0.1995	6.664	9.75×10^{-2}	7.14×10^{-3}
0.2005	7.326	0.104	7.65×10^{-3}
0.2015	8.023	0.112	8.21×10^{-3}
0.2025	8.261	0.120	8.81×10^{-3}

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.2035	9.217	0.129	9.44×10^{-3}
0.2045	10.25	0.139	1.02×10^{-2}
0.2055	10.54	0.149	1.09×10^{-2}
0.2065	11.08	0.160	1.17×10^{-2}
0.2075	12.65	0.172	1.26×10^{-2}
0.2085	15.05	0.186	1.36×10^{-2}
0.2095	21.38	0.204	1.49×10^{-2}
0.2105	27.92	0.229	1.67×10^{-2}
0.2115	33.54	0.259	1.90×10^{-2}
0.2125	31.30	0.292	2.14×10^{-2}
0.2135	33.15	0.324	2.37×10^{-2}
0.2145	40.03	0.360	2.64×10^{-2}
0.2155	36.15	0.399	2.92×10^{-2}
0.2165	32.27	0.433	3.17×10^{-2}
0.2175	35.29	0.467	3.42×10^{-2}
0.2185	44.37	0.506	3.71×10^{-2}
0.2195	46.92	0.552	4.04×10^{-2}
0.2205	47.33	0.599	4.39×10^{-2}
0.2215	39.58	0.643	4.70×10^{-2}
0.2225	49.65	0.687	5.03×10^{-2}
0.2235	63.01	0.744	5.44×10^{-2}
0.2245	58.97	0.805	5.89×10^{-2}
0.2255	52.29	0.860	6.30×10^{-2}
0.2265	39.40	0.906	6.63×10^{-2}
0.2275	39.92	0.946	6.92×10^{-2}
0.2285	51.95	0.992	7.26×10^{-2}
0.2295	47.71	1.04	7.62×10^{-2}
0.2305	52.12	1.09	7.99×10^{-2}
0.2315	50.97	1.14	8.37×10^{-2}
0.2325	53.26	1.20	8.75×10^{-2}
0.2335	44.74	1.24	9.11×10^{-2}
0.2345	38.97	1.29	9.41×10^{-2}
0.2355	51.42	1.33	9.74×10^{-2}
0.2365	48.59	1.38	0.101

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.2375	48.44	1.43	0.105
0.2385	41.96	1.47	0.108
0.2395	44.12	1.52	0.111
0.2405	39.56	1.56	0.114
0.2415	51.48	1.61	0.118
0.2425	70.60	1.67	0.122
0.2435	66.53	1.73	0.127
0.2445	60.97	1.80	0.132
0.2455	49.39	1.85	0.136
0.2465	50.40	1.90	0.139
0.2475	55.50	1.96	0.143
0.2485	45.65	2.01	0.147
0.2495	56.38	2.06	0.151
0.2505	60.10	2.12	0.155
0.2515	46.01	2.17	0.159
0.2525	41.55	2.21	0.162
0.2535	51.55	2.26	0.165
0.2545	59.57	2.32	0.169
0.2555	79.30	2.38	0.175
0.2565	101.8	2.48	0.181
0.2575	125.4	2.59	0.190
0.2585	125.1	2.71	0.199
0.2595	104	2.83	0.207
0.2605	88.51	2.92	0.214
0.2615	89.80	3.01	0.220
0.2625	103.6	3.11	0.228
0.2635	165.8	3.24	0.237
0.2645	249.7	3.45	0.253
0.2655	252.7	3.70	0.271
0.2665	249.4	3.95	0.289
0.2675	250.8	4.20	0.308
0.2685	243.8	4.45	0.326
0.2695	238.9	4.69	0.343
0.2705	267.3	4.94	0.362

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.2715	224.4	5.19	0.380
0.2725	197.4	5.40	0.395
0.2735	196.5	5.60	0.41
0.2745	132.6	5.76	0.422
0.2755	175.1	5.92	0.433
0.2765	242.8	6.13	0.448
0.2775	233.8	6.36	0.466
0.2785	159.3	6.56	0.480
0.2795	85.55	6.68	0.489
0.2805	94.63	6.77	0.496
0.2815	208.3	6.92	0.507
0.2825	294.1	7.18	0.525
0.2835	313.5	7.48	0.547
0.2845	235.3	7.75	0.568
0.2855	163.1	7.95	0.582
0.2865	322.7	8.20	0.600
0.2875	336.3	8.53	0.624
0.2885	322.2	8.85	0.648
0.2895	472.7	9.25	0.677
0.2905	601.3	9.79	0.717
0.2915	580.8	10.38	0.760
0.2925	521.9	10.93	0.800
0.2935	535.5	11.46	0.839
0.2945	508.8	11.98	0.877
0.2955	553.2	12.51	0.916
0.2965	509.6	13.04	0.955
0.2975	507.3	13.55	0.992
0.2985	465.5	14.04	1.03
0.2995	484.0	14.51	1.06
0.3005	420.0	14.97	1.10
0.3015	455.5	15.40	1.13
0.3025	489.0	15.88	1.16
0.3035	620.6	16.43	1.20
0.3045	602.5	17.04	1.25

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.3055	594.8	17.64	1.29
0.3065	555.7	18.22	1.33
0.3075	615.0	18.80	1.38
0.3085	611.4	19.42	1.42
0.3095	496.5	19.97	1.46
0.3105	622.4	20.53	1.50
0.3115	729.2	21.20	1.55
0.3125	655.9	21.90	1.60
0.3135	699.9	22.58	1.65
0.3145	662.9	23.26	1.70
0.3155	633.0	23.90	1.75
0.3165	633.2	24.54	1.80
0.3175	773.9	25.24	1.85
0.3185	664.9	25.96	1.90
0.3195	710.5	26.65	1.95
0.3205	805.1	27.41	2.01
0.3215	699.5	28.16	2.06
0.3225	688.6	28.85	2.11
0.3235	661.3	29.53	2.16
0.3245	760.8	30.24	2.21
0.3255	875.8	31.06	2.27
0.3265	979.5	31.98	2.34
0.3275	952.7	32.95	2.41
0.3285	917.6	33.89	2.48
0.3295	1061	34.87	2.55
0.3305	1016	35.91	2.63
0.3315	965.7	36.90	2.70
0.3325	954.9	37.86	2.77
0.3335	921.6	38.80	2.84
0.3345	958.9	39.74	2.91
0.3355	943.4	40.69	2.98
0.3365	809.5	41.57	3.04
0.3375	841.8	42.40	3.10
0.3385	921.5	43.28	3.17

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.3395	958.1	44.22	3.24
0.3405	1007	45.20	3.31
0.3415	923.8	46.17	3.38
0.3425	993.0	47.12	3.45
0.3435	950.6	48.10	3.52
0.3445	795.7	48.97	3.58
0.3455	939.2	49.84	3.65
0.3465	926.4	50.77	3.72
0.3475	901.7	51.68	3.78
0.3485	897.2	52.58	3.85
0.3495	889.8	53.48	3.91
0.3505	1050	54.45	3.99
0.3515	979.5	55.46	4.06
0.3525	907.9	56.40	4.13
0.3535	1033	57.37	4.20
0.3545	1111	58.45	4.28
0.3555	1045	59.52	4.36
0.3565	912.3	60.50	4.43
0.3575	796.0	61.36	4.49
0.3585	693.6	62.10	4.55
0.3595	991.1	62.94	4.61
0.3605	970.8	63.92	4.68
0.3615	878.1	64.85	4.75
0.3625	997.8	65.79	4.82
0.3635	996.9	66.78	4.89
0.3645	1013	67.79	4.96
0.3655	1152	68.87	5.04
0.3665	1233	70.07	5.13
0.3675	1180	71.27	5.22
0.3685	1101	72.41	5.30
0.3695	1226	73.58	5.39
0.3705	1139	74.76	5.47
0.3715	1175	75.91	5.56
0.3725	1054	77.03	5.64

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.3735	920.2	78.02	5.71
0.3745	900.4	78.93	5.78
0.3755	1062	79.91	5.85
0.3765	1085	80.98	5.93
0.3775	1282	82.16	6.01
0.3785	1327	83.47	6.11
0.3795	1066	84.67	6.20
0.3805	1202	85.80	6.28
0.3815	1082	86.94	6.36
0.3825	791.3	87.88	6.43
0.3835	684.1	88.62	6.49
0.3845	959.7	89.44	6.55
0.3855	1008	90.42	6.62
0.3865	1007	91.43	6.69
0.3875	1004	92.43	6.77
0.3885	984.3	93.43	6.84
0.3895	1174	94.51	6.92
0.3905	1247	95.72	7.01
0.3915	1342	97.01	7.10
0.3925	1019	98.19	7.19
0.3935	582.3	98.99	7.25
0.3945	1026	99.80	7.31
0.3955	1314	100.97	7.39
0.3965	854.5	102.05	7.47
0.3975	928.8	102.94	7.54
0.3985	1522	104.17	7.63
0.3995	1663	105.76	7.74
0.4005	1682	107.43	7.86
0.4015	1746	109.15	7.99
0.4025	1759	110.90	8.12
0.4035	1684	112.62	8.24
0.4045	1674	114.30	8.37
0.4055	1667	115.97	8.49
0.4065	1589	117.60	8.61

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.4075	1628	119.21	8.73
0.4085	1735	120.89	8.85
0.4095	1715	122.61	8.98
0.4105	1532	124.24	9.09
0.4115	1817	125.91	9.22
0.4125	1789	127.71	9.35
0.4135	1756	129.49	9.48
0.4145	1737	131.23	9.61
0.4155	1734	132.97	9.73
0.4165	1842	134.76	9.86
0.4175	1665	136.51	9.99
0.4185	1684	138.18	10.12
0.4195	1701	139.88	10.24
0.4205	1757	141.60	10.37
0.4215	1797	143.38	10.50
0.4225	1582	145.07	10.62
0.4235	1711	146.72	10.74
0.4245	1767	148.46	10.87
0.4255	1695	150.19	10.99
0.4265	1698	151.88	11.12
0.4275	1569	153.52	11.24
0.4285	1587	155.10	11.35
0.4295	1475	156.63	11.47
0.4305	1135	157.93	11.56
0.4315	1686	159.34	11.66
0.4325	1646	161.01	11.79
0.4335	1731	162.70	11.91
0.4345	1670	164.40	12.03
0.4355	1723	166.09	12.16
0.4365	1929	167.92	12.29
0.4375	1806	169.79	12.43
0.4385	1567	171.47	12.55
0.4395	1825	173.17	12.68
0.4405	1713	174.94	12.81

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.4415	1931	176.76	12.94
0.4425	1980	178.71	13.08
0.4435	1909	180.66	13.22
0.4445	1973	182.60	13.37
0.4455	1821	184.50	13.51
0.4465	1891	186.35	13.64
0.4475	2077	188.34	13.79
0.4485	1973	190.36	13.93
0.4495	2027	192.36	14.08
0.4505	2144	194.45	14.23
0.4515	2109	196.57	14.39
0.4525	1941	198.60	14.54
0.4535	1970	200.55	14.68
0.4545	1979	202.53	14.83
0.4555	2034	204.53	14.97
0.4565	2077	206.59	15.12
0.4575	2100	208.68	15.28
0.4585	1971	210.71	15.42
0.4595	2009	212.70	15.57
0.4605	2040	214.73	15.72
0.4615	2055	216.77	15.87
0.4625	2104	218.85	16.02
0.4635	2040	220.93	16.17
0.4645	1976	222.93	16.32
0.4655	2042	224.94	16.47
0.4665	1921	226.92	16.61
0.4675	2015	228.89	16.76
0.4685	1994	230.90	16.90
0.4695	1990	232.89	17.05
0.4705	1877	234.82	17.19
0.4715	2018	236.77	17.33
0.4725	2041	238.80	17.48
0.4735	1991	240.81	17.63
0.4745	2051	242.84	17.78

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.4755	2016	244.87	17.92
0.4765	1956	246.85	18.07
0.4775	2075	248.87	18.22
0.4785	2009	250.91	18.37
0.4795	2076	252.95	18.52
0.4805	2035	255.01	18.67
0.4815	2090	257.07	18.82
0.4825	2023	259.13	18.97
0.4835	2019	261.15	19.12
0.4845	1969	263.14	19.26
0.4855	1830	265.04	19.40
0.4865	1625	266.77	19.53
0.4875	1830	268.50	19.65
0.4885	1914	270.37	19.79
0.4895	1960	272.31	19.93
0.4905	2007	274.29	20.08
0.4915	1896	276.24	20.22
0.4925	1896	278.14	20.36
0.4935	1888	280.03	20.50
0.4945	2058	282.00	20.64
0.4955	1926	283.99	20.79
0.4965	2017	285.97	20.93
0.4975	2018	287.98	21.08
0.4985	1866	289.93	21.22
0.4995	1970	291.84	21.36
0.5005	1857	293.76	21.50
0.5015	1812	295.59	21.64
0.5025	1894	297.44	21.77
0.5035	1934	299.36	21.91
0.5045	1869	301.26	22.05
0.5055	1993	303.19	22.19
0.5065	1961	305.17	22.34
0.5075	1906	307.10	22.48
0.5085	1919	309.01	22.62

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.5095	1916	310.93	22.76
0.5105	1947	312.86	22.90
0.5115	1997	314.84	23.05
0.5125	1867	316.77	23.19
0.5135	1861	318.63	23.32
0.5145	1874	320.50	23.46
0.5155	1900	322.39	23.60
0.5165	1669	324.17	23.73
0.5175	1726	325.87	23.85
0.5185	1654	327.56	23.98
0.5195	1828	329.30	24.11
0.5205	1831	331.13	24.24
0.5215	1906	333.00	24.38
0.5225	1823	334.86	24.51
0.5235	1894	336.72	24.65
0.5245	1958	338.65	24.79
0.5255	1930	340.59	24.93
0.5265	1674	342.39	25.06
0.5275	1828	344.14	25.19
0.5285	1897	346.01	25.33
0.5295	1918	347.91	25.47
0.5305	1952	349.85	25.61
0.5315	1963	351.81	25.75
0.5325	1770	353.67	25.89
0.5335	1923	355.52	26.02
0.5345	1858	357.41	26.16
0.5355	1990	359.34	26.30
0.5365	1871	361.27	26.45
0.5375	1882	363.14	26.58
0.5385	1904	365.04	26.72
0.5395	1832	366.90	26.86
0.5405	1760	368.70	26.99
0.5415	1881	370.53	27.12
0.5425	1825	372.38	27.26

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.5435	1879	374.24	27.39
0.5445	1879	376.11	27.53
0.5455	1901	378.00	27.67
0.5465	1879	379.90	27.81
0.5475	1833	381.75	27.94
0.5485	1863	383.60	28.08
0.5495	1895	385.48	28.22
0.5505	1862	387.36	28.35
0.5515	1871	389.22	28.49
0.5525	1846	391.08	28.63
0.5535	1882	392.95	28.76
0.5545	1898	394.84	28.90
0.5555	1897	396.73	29.04
0.5565	1821	398.59	29.18
0.5575	1846	400.43	29.31
0.5585	1787	402.24	29.44
0.5595	1808	404.04	29.58
0.5605	1843	405.87	29.71
0.5615	1824	407.70	29.84
0.5625	1850	409.54	29.98
0.5635	1861	411.40	30.11
0.5645	1854	413.25	30.25
0.5655	1798	415.08	30.38
0.5665	1829	416.89	30.52
0.5675	1887	418.75	30.65
0.5685	1810	420.60	30.79
0.5695	1860	422.44	30.92
0.5705	1769	424.25	31.06
0.5715	1823	426.05	31.19
0.5725	1892	427.90	31.32
0.5735	1876	429.79	31.46
0.5745	1867	431.66	31.6
0.5755	1830	433.51	31.73
0.5765	1846	435.35	31.87

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.5775	1857	437.20	32.00
0.5785	1783	439.02	32.14
0.5795	1828	440.83	32.27
0.5805	1838	442.66	32.40
0.5815	1853	444.50	32.54
0.5825	1873	446.37	32.67
0.5835	1857	448.23	32.81
0.5845	1860	450.09	32.95
0.5855	1783	451.91	33.08
0.5865	1830	453.72	33.21
0.5875	1848	455.56	33.35
0.5885	1750	457.36	33.48
0.5895	1612	459.04	33.60
0.5905	1813	460.75	33.73
0.5915	1787	462.55	33.86
0.5925	1808	464.35	33.99
0.5935	1796	466.15	34.12
0.5945	1773	467.94	34.25
0.5955	1782	469.72	34.38
0.5965	1805	471.51	34.52
0.5975	1780	473.80	34.65
0.5985	1757	475.07	34.78
0.5995	1774	476.84	34.91
0.6005	1746	478.60	35.03
0.6015	1751	480.35	35.16
0.6025	1719	482.08	35.29
0.6035	1787	483.83	35.42
0.6045	1776	485.61	35.55
0.6055	1763	487.38	35.68
0.6065	1759	489.15	35.81
0.6075	1757	490.90	35.93
0.6085	1743	492.65	36.06
0.6095	1744	494.40	36.19
0.6105	1703	496.12	36.32

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.6115	1746	497.85	36.44
0.6125	1705	499.57	36.57
0.6135	1683	501.26	36.69
0.6145	1713	502.96	36.82
0.6155	1713	504.67	36.94
0.6165	1609	506.33	37.06
0.6175	1707	507.99	37.19
0.6185	1724	509.71	37.31
0.6195	1707	511.42	37.44
0.6205	1734	513.14	37.56
0.6215	1690	514.85	37.69
0.6225	1713	516.56	37.81
0.6235	1666	518.24	37.94
0.6245	1656	519.91	38.06
0.6255	1632	521.55	38.18
0.6265	1697	523.21	38.30
0.6275	1697	524.91	38.42
0.6285	1697	526.61	38.55
0.6295	1677	528.29	38.67
0.631	1639	530.78	38.85
0.633	1651	534.07	39.09
0.635	1656	537.38	39.34
0.637	1654	540.69	39.58
0.639	1651	543.99	39.82
0.641	1614	547.25	40.06
0.643	1621	550.49	40.3
0.645	1627	553.74	40.53
0.647	1603	556.97	40.77
0.649	1558	560.13	41.00
0.651	1606	563.29	41.23
0.653	1599	566.50	41.47
0.655	1532	569.63	41.70
0.657	1384	572.54	41.91
0.659	1549	575.48	42.13

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.661	1571	578.60	42.35
0.663	1555	581.72	42.58
0.665	1560	584.84	42.81
0.667	1535	587.93	43.04
0.669	1546	591.01	43.26
0.671	1516	594.08	43.49
0.673	1521	597.11	43.71
0.675	1510	600.15	43.93
0.677	1508	603.16	44.15
0.679	1498	606.17	44.37
0.681	1492	609.16	44.59
0.683	1479	612.13	44.81
0.685	1455	615.07	45.02
0.687	1467	617.99	45.24
0.689	1461	620.92	45.45
0.691	1448	623.83	45.66
0.693	1448	626.72	45.88
0.695	1436	629.61	46.09
0.697	1416	632.46	46.30
0.699	1425	635.30	46.50
0.701	1386	638.11	46.71
0.703	1388	640.89	46.91
0.705	1415	643.69	47.12
0.707	1400	646.51	47.33
0.709	1384	649.29	47.53
0.711	1385	652.06	47.73
0.713	1373	654.82	47.93
0.715	1366	657.56	48.13
0.717	1354	660.28	48.33
0.719	1328	662.96	48.53
0.721	1331	665.62	48.72
0.723	1348	668.30	48.92
0.725	1350	671.00	49.12
0.727	1346	673.69	49.31

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.729	1319	676.36	49.51
0.731	1326	679.00	49.70
0.733	1318	681.64	49.90
0.735	1309	684.27	50.09
0.737	1307	686.89	50.28
0.739	1278	689.47	50.47
0.741	1258	692.01	50.66
0.743	1286	694.55	50.84
0.745	1279	697.11	51.03
0.747	1283	699.67	51.22
0.749	1270	702.23	51.40
0.751	1262	704.76	51.59
0.753	1259	707.28	51.77
0.755	1255	709.79	51.96
0.757	1248	712.30	52.14
0.759	1240	714.78	52.32
0.761	1237	717.26	52.50
0.763	1241	719.74	52.69
0.765	1221	722.20	52.87
0.767	1185	724.60	53.04
0.769	1203	726.99	53.22
0.771	1204	729.40	53.39
0.773	1208	731.81	53.57
0.775	1188	734.21	53.74
0.777	1196	736.59	53.92
0.779	1187	738.97	54.09
0.781	1187	741.35	54.27
0.783	1176	743.71	54.44
0.785	1180	746.07	54.61
0.787	1177	748.42	54.79
0.789	1174	750.77	54.96
0.791	1158	753.11	55.13
0.793	1143	755.41	55.30
0.795	1134	757.68	55.46

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.797	1152	759.97	55.63
0.799	1135	762.26	55.80
0.801	1142	764.54	55.96
0.803	1129	766.81	56.13
0.805	1115	769.05	56.30
0.807	1120	771.29	56.46
0.809	1095	773.50	56.62
0.811	1114	775.71	56.78
0.813	1115	777.94	56.95
0.815	1107	780.16	57.11
0.817	1104	782.37	57.27
0.819	1063	784.54	57.43
0.821	1080	786.68	57.59
0.823	1073	788.84	57.74
0.825	1075	790.99	57.90
0.826	1080	792.06	57.98
0.828	1081	794.23	58.14
0.830	1063	796.37	58.30
0.832	1051	798.48	58.45
0.834	1041	800.58	58.60
0.836	1052	802.67	58.76
0.838	1044	804.77	58.91
0.840	1040	806.85	59.06
0.842	1036	808.93	59.21
0.844	1024	810.99	59.37
0.846	1028	813.04	59.52
0.848	1023	815.09	59.67
0.850	966.0	817.08	59.81
0.852	996.1	819.04	59.95
0.854	878.0	820.92	60.09
0.856	975.5	822.77	60.23
0.858	1005	824.75	60.37
0.860	996.9	826.75	60.52
0.862	994.9	828.75	60.67

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.864	999.3	830.74	60.81
0.866	886.2	832.63	60.95
0.868	939.5	834.45	61.08
0.870	974.7	836.37	61.22
0.872	983.3	838.32	61.37
0.874	971.3	840.28	61.51
0.876	964.0	842.21	61.65
0.878	974.9	844.15	61.79
0.880	955.4	846.08	61.93
0.882	951.1	847.99	62.07
0.884	957.9	849.90	62.21
0.886	938.3	851.79	62.35
0.888	944.3	853.68	62.49
0.890	953.0	855.57	62.63
0.892	939.4	857.47	62.77
0.894	933.2	859.34	62.90
0.896	938.7	861.21	63.04
0.898	933.9	863.08	63.18
0.900	915.8	864.93	63.31
0.902	891.6	866.74	63.45
0.904	928.5	868.56	63.58
0.906	917.6	870.41	63.71
0.908	902.5	872.23	63.85
0.910	891.6	874.02	63.98
0.912	896.7	875.81	64.11
0.914	907.1	877.61	64.24
0.916	900.4	879.42	64.37
0.918	895.1	881.22	64.51
0.920	890.8	883.00	64.64
0.922	863.0	884.76	64.77
0.924	858.5	886.48	64.89
0.926	861.2	888.20	65.02
0.928	876.9	889.94	65.14
0.930	867.7	891.68	65.27

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
0.932	865.1	893.41	65.40
0.934	864.1	895.14	65.53
0.936	854.7	896.86	65.65
0.938	858.0	898.57	65.78
0.940	843.8	900.28	65.90
0.942	825.0	901.94	66.02
0.944	832.4	903.60	66.14
0.946	837.5	905.27	66.27
0.948	840.7	906.95	66.39
0.950	836.9	908.63	66.51
0.952	831.7	910.30	66.63
0.954	808.0	911.94	66.75
0.956	808.2	913.55	66.87
0.958	818.8	915.18	66.99
0.960	815.1	916.81	67.11
0.962	808.9	918.44	67.23
0.964	801.3	920.05	67.35
0.966	794.7	921.64	67.47
0.968	796.9	923.23	67.58
0.970	795.9	924.83	67.70
0.972	793.6	926.42	67.81
0.974	781.5	927.99	67.93
0.976	782.5	929.56	68.04
0.978	777.9	931.12	68.16
0.980	774.6	932.67	68.27
0.982	776.4	934.22	68.39
0.984	769.8	935.77	68.50
0.986	766.1	937.30	68.61
0.988	761.5	938.83	68.72
0.990	754.1	940.34	68.83
0.992	756.7	941.86	68.94
0.994	755.6	943.37	69.06
0.996	752.5	944.88	69.17
0.998	751.0	946.38	69.28

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.000	747.9	947.88	69.39
1.002	746.9	949.37	69.50
1.004	726.1	950.85	69.6
1.006	713.6	952.29	69.71
1.008	733.5	953.73	69.81
1.010	731.3	955.20	69.92
1.012	726.2	956.66	70.03
1.014	721.0	958.10	70.13
1.016	713.9	959.54	70.24
1.018	710.7	960.96	70.34
1.020	704.1	962.38	70.45
1.022	702.1	963.78	70.55
1.024	705.4	965.19	70.65
1.026	702.7	966.60	70.76
1.028	698.9	968.00	70.86
1.030	693.7	969.39	70.96
1.032	690.5	970.78	71.06
1.034	681.7	972.15	71.16
1.036	684.0	973.52	71.26
1.038	677.2	974.88	71.36
1.040	676.1	976.23	71.46
1.042	674.6	977.58	71.56
1.044	671.4	978.93	71.66
1.046	660.0	980.26	71.76
1.048	664.4	981.58	71.85
1.050	662.2	982.91	71.95
1.052	658.6	984.23	72.05
1.054	654.9	985.54	72.14
1.056	655.7	986.85	72.24
1.058	645.1	988.15	72.33
1.060	641.5	989.44	72.43
1.062	643.8	990.73	72.52
1.064	645.9	992.02	72.62
1.066	639.5	993.30	72.71

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.068	631.7	994.57	72.80
1.070	624.1	995.83	72.90
1.072	632.6	997.09	72.99
1.074	627.6	998.35	73.08
1.076	628.0	999.60	73.17
1.078	627.2	1000.86	73.26
1.080	624.7	1002.11	73.36
1.082	609.9	1003.34	73.45
1.084	618.0	1004.57	73.54
1.086	620.8	1005.81	73.63
1.088	610.3	1007.04	73.72
1.090	619.9	1008.27	73.81
1.092	615.9	1009.51	73.90
1.094	584.9	1010.71	73.98
1.096	598.3	1011.89	74.07
1.098	596.1	1013.09	74.16
1.100	604.2	1014.29	74.25
1.102	593.2	1015.48	74.33
1.104	597.4	1016.67	74.42
1.106	594.5	1017.87	74.51
1.108	591.6	1019.05	74.60
1.110	590.6	1020.23	74.68
1.112	584.3	1021.41	74.77
1.114	584.4	1022.58	74.85
1.116	583.1	1023.74	74.94
1.118	581.5	1024.91	75.02
1.120	574.1	1026.06	75.11
1.122	579.6	1027.22	75.19
1.124	576.9	1028.38	75.28
1.126	565.5	1029.52	75.36
1.128	570.0	1030.65	75.44
1.130	565.3	1031.79	75.53
1.132	567.8	1032.92	75.61
1.134	563.8	1034.05	75.69

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.136	565.8	1035.18	75.78
1.138	556.9	1036.31	75.86
1.140	553.0	1037.42	75.94
1.142	553.1	1038.52	76.02
1.144	551.4	1039.63	76.10
1.146	554.8	1040.73	76.18
1.148	552.5	1041.84	76.26
1.150	548.9	1042.94	76.34
1.152	545.8	1044.04	76.42
1.154	547.9	1045.13	76.50
1.156	545.5	1046.22	76.58
1.158	543.5	1047.31	76.66
1.160	532.0	1048.39	76.74
1.162	532.5	1049.45	76.82
1.164	533.2	1050.52	76.90
1.166	530.3	1051.58	76.98
1.168	531.2	1052.64	77.05
1.170	527.6	1053.70	77.13
1.172	531.5	1054.76	77.21
1.174	527.3	1055.82	77.29
1.176	518.4	1056.86	77.36
1.178	519.0	1057.90	77.44
1.180	523.9	1058.94	77.52
1.182	515.9	1059.98	77.59
1.184	510.3	1061.01	77.67
1.186	518.7	1062.04	77.74
1.188	507.5	1063.07	77.82
1.190	508.5	1064.08	77.89
1.192	516.1	1065.11	77.97
1.194	514.5	1066.14	78.04
1.196	508.4	1067.16	78.12
1.198	494.3	1068.16	78.19
1.200	500.3	1069.16	78.26
1.202	506.8	1070.16	78.34

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.204	494.8	1071.17	78.41
1.206	503.9	1072.16	78.48
1.208	489.0	1073.16	78.56
1.210	488.2	1074.14	78.63
1.212	493.3	1075.12	78.70
1.214	494.2	1076.10	78.77
1.216	493.0	1077.09	78.84
1.218	489.7	1078.07	78.92
1.220	487.5	1079.05	78.99
1.222	485.4	1080.02	79.06
1.224	484.6	1080.99	79.13
1.226	481.7	1081.96	79.20
1.228	477.1	1082.92	79.27
1.230	479.2	1083.87	79.34
1.232	475	1084.83	79.41
1.234	472.9	1085.78	79.48
1.236	471.9	1086.72	79.55
1.238	470.3	1087.66	79.62
1.240	465.3	1088.60	79.69
1.242	464.2	1089.53	79.75
1.244	461.9	1090.46	79.82
1.246	463.5	1091.38	79.89
1.248	463.3	1092.31	79.96
1.250	462.4	1093.23	80.03
1.252	457.1	1094.15	80.09
1.254	457.4	1095.07	80.16
1.256	455.1	1095.98	80.23
1.258	453.3	1096.89	80.29
1.260	453.0	1097.79	80.36
1.262	449.7	1098.70	80.43
1.264	447.8	1099.59	80.49
1.266	446.7	1100.49	80.56
1.268	441.7	1101.38	80.62
1.270	445.3	1102.26	80.69

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.272	445.2	1103.16	80.75
1.274	443.1	1104.04	80.82
1.276	445.1	1104.93	80.88
1.278	444.0	1105.82	80.95
1.280	435.6	1106.70	81.01
1.282	401.4	1107.54	81.07
1.284	425.9	1108.37	81.13
1.286	432.8	1109.22	81.2
1.288	431.4	1110.09	81.26
1.290	425.5	1110.94	81.32
1.292	425.4	1111.80	81.38
1.294	422.3	1112.64	81.45
1.296	422.4	1113.49	81.51
1.298	418.4	1114.33	81.57
1.300	418.6	1115.17	81.63
1.302	413.9	1116.00	81.69
1.304	411.1	1116.82	81.75
1.306	413.6	1117.65	81.81
1.308	412.3	1118.47	81.87
1.310	410.6	1119.30	81.93
1.312	403.3	1120.11	81.99
1.314	402.2	1120.92	82.05
1.316	397.9	1121.72	82.11
1.318	401.7	1122.52	82.17
1.320	401.6	1123.32	82.23
1.322	398.6	1124.12	82.29
1.324	398.1	1124.92	82.35
1.326	394.9	1125.71	82.40
1.328	390.8	1126.49	82.46
1.330	387.8	1127.27	82.52
1.332	386.3	1128.05	82.57
1.334	389.2	1128.82	82.63
1.336	386.6	1129.60	82.69
1.338	383.2	1130.37	82.74

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.340	379.0	1131.13	82.80
1.342	380.5	1131.89	82.86
1.344	379.8	1132.65	82.91
1.346	377.2	1133.41	82.97
1.348	376.6	1134.16	83.02
1.350	372.4	1134.91	83.08
1.352	374.2	1135.66	83.13
1.354	372.2	1136.40	83.19
1.356	367.5	1137.14	83.24
1.358	368.8	1137.88	83.29
1.360	367.3	1138.62	83.35
1.362	367.7	1139.35	83.4
1.364	365.7	1140.08	83.46
1.366	365.7	1140.81	83.51
1.368	362.8	1141.54	83.56
1.370	359.9	1142.27	83.62
1.372	362.1	1142.99	83.67
1.374	361.1	1143.71	83.72
1.376	356.1	1144.43	83.77
1.378	358.0	1145.14	83.83
1.380	357.9	1145.86	83.88
1.382	354.5	1146.57	83.93
1.384	354.7	1147.28	83.98
1.386	353.2	1147.99	84.03
1.388	353.0	1148.69	84.09
1.390	350.6	1149.40	84.14
1.392	351.3	1150.10	84.19
1.394	348.8	1150.80	84.24
1.396	348.7	1151.50	84.29
1.398	349.2	1152.19	84.34
1.400	342.7	1152.89	84.39
1.402	343.9	1153.57	84.44
1.404	342.8	1154.26	84.49
1.406	343.1	1154.95	84.54

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.408	342.7	1155.63	84.59
1.410	341.8	1156.32	84.64
1.412	334.8	1156.99	84.69
1.414	337.7	1157.67	84.74
1.416	338.5	1158.34	84.79
1.418	338.6	1159.02	84.84
1.420	335.7	1159.69	84.89
1.422	331.5	1160.36	84.94
1.424	331.1	1161.02	84.99
1.426	328.1	1161.68	85.04
1.428	328.5	1162.34	85.08
1.430	325.7	1162.99	85.13
1.432	330.0	1163.65	85.18
1.434	328.4	1164.31	85.23
1.436	328.5	1164.96	85.28
1.438	328.3	1165.62	85.32
1.440	318.8	1166.27	85.37
1.442	318.6	1166.91	85.42
1.444	319.7	1167.54	85.47
1.446	321.6	1168.19	85.51
1.448	321.6	1168.83	85.56
1.450	318.7	1169.47	85.61
1.452	315.4	1170.10	85.65
1.454	314.3	1170.73	85.70
1.456	313.1	1171.36	85.74
1.458	316.7	1171.99	85.79
1.460	315.6	1172.62	85.84
1.462	312.1	1173.25	85.88
1.464	310.5	1173.87	85.93
1.466	310.8	1174.49	85.97
1.468	311.4	1175.12	86.02
1.470	310.2	1175.74	86.07
1.472	307.3	1176.35	86.11
1.474	303.4	1176.96	86.16

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.476	304.8	1177.57	86.20
1.478	304.4	1178.18	86.24
1.480	306.8	1178.79	86.29
1.482	304.4	1179.40	86.33
1.484	303.9	1180.01	86.38
1.486	303.3	1180.62	86.42
1.488	285.5	1181.21	86.47
1.490	301.5	1181.80	86.51
1.492	301.8	1182.40	86.55
1.494	303.3	1183.00	86.60
1.496	297.2	1183.60	86.64
1.498	299.4	1184.20	86.68
1.500	301.1	1184.80	86.73
1.502	292.4	1185.40	86.77
1.504	279.9	1185.97	86.81
1.506	284.8	1186.53	86.86
1.508	291.9	1187.11	86.90
1.510	294.7	1187.70	86.94
1.512	291.3	1188.28	86.98
1.514	288.3	1188.86	87.03
1.516	288.2	1189.44	87.07
1.518	288.4	1190.01	87.11
1.520	286.6	1190.59	87.15
1.522	282.4	1191.16	87.19
1.524	283.5	1191.72	87.24
1.526	284.6	1192.29	87.28
1.528	284.6	1192.86	87.32
1.530	276.5	1193.42	87.36
1.532	282.3	1193.98	87.40
1.534	278.4	1194.54	87.44
1.536	280.6	1195.10	87.48
1.538	277.3	1195.66	87.52
1.540	273.0	1196.21	87.56
1.542	275.3	1196.76	87.60

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.544	277.8	1197.31	87.64
1.546	277.2	1197.87	87.69
1.548	271.1	1198.41	87.73
1.550	271.3	1198.96	87.76
1.552	273.1	1199.50	87.80
1.554	267.6	1200.04	87.84
1.556	267.1	1200.58	87.88
1.558	268.9	1201.11	87.92
1.560	268.3	1201.65	87.96
1.562	269.7	1202.19	88.00
1.564	266.9	1202.73	88.04
1.566	265.4	1203.26	88.08
1.568	263.3	1203.79	88.12
1.570	264.5	1204.31	88.16
1.572	267.3	1204.85	88.20
1.574	261.0	1205.37	88.23
1.576	253.6	1205.89	88.27
1.578	254.7	1206.40	88.31
1.580	265.0	1206.92	88.35
1.582	259.0	1207.44	88.39
1.584	259.1	1207.96	88.42
1.586	259.9	1208.48	88.46
1.588	249.0	1208.99	88.50
1.590	240.5	1209.48	88.53
1.592	252.6	1209.97	88.57
1.594	258.3	1210.48	88.61
1.596	250.6	1210.99	88.65
1.598	254.5	1211.49	88.68
1.600	251.2	1212.00	88.72
1.602	248.9	1212.50	88.76
1.604	249.7	1213.00	88.79
1.606	247.7	1213.50	88.83
1.608	249.1	1213.99	88.87
1.610	240.0	1214.48	88.90

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.612	243.0	1214.96	88.94
1.614	244.9	1215.45	88.97
1.616	237.4	1215.93	89.01
1.618	242.3	1216.41	89.04
1.620	236.9	1216.89	89.08
1.622	238.3	1217.37	89.11
1.624	241.6	1217.85	89.15
1.626	240.2	1218.33	89.18
1.628	241.8	1218.81	89.22
1.630	239.3	1219.29	89.25
1.632	238.7	1219.77	89.29
1.634	235.9	1220.25	89.32
1.636	235.7	1220.72	89.36
1.638	227.4	1221.18	89.39
1.640	226.2	1221.63	89.42
1.642	226.6	1222.09	89.46
1.644	227.8	1222.54	89.49
1.646	229.4	1223.00	89.52
1.648	229.2	1223.46	89.56
1.650	227.2	1223.91	89.59
1.652	226.8	1224.37	89.63
1.654	226.2	1224.82	89.66
1.656	226.0	1225.27	89.69
1.658	225.2	1225.72	89.72
1.660	224.5	1226.17	89.76
1.662	224.6	1226.62	89.79
1.664	222.7	1227.07	89.82
1.666	221.2	1227.51	89.86
1.668	219.3	1227.95	89.89
1.670	222.5	1228.40	89.92
1.672	217.3	1228.84	89.95
1.674	219.3	1229.27	89.98
1.676	216.1	1229.71	90.02
1.678	216.8	1230.14	90.05

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.680	208.0	1230.57	90.08
1.682	205.4	1230.98	90.11
1.684	212.9	1231.40	90.14
1.686	213.1	1231.82	90.17
1.688	212.0	1232.25	90.20
1.690	210.5	1232.67	90.23
1.692	212.3	1233.09	90.26
1.694	211.2	1233.52	90.29
1.696	210.0	1233.94	90.33
1.698	208.9	1234.36	90.36
1.700	206.3	1234.77	90.39
1.702	204.7	1235.18	90.42
1.704	205.2	1235.59	90.45
1.706	205.0	1236.01	90.48
1.708	201.7	1236.41	90.51
1.710	201.3	1236.81	90.54
1.712	198.2	1237.21	90.57
1.714	203.7	1237.62	90.59
1.716	202.2	1238.02	90.62
1.718	201.0	1238.42	90.65
1.720	199.3	1238.82	90.68
1.722	197.5	1239.22	90.71
1.724	195.4	1239.61	90.74
1.726	198.2	1240.01	90.77
1.728	197.1	1240.40	90.80
1.730	198.4	1240.80	90.83
1.732	193.6	1241.19	90.86
1.734	187.4	1241.57	90.88
1.736	182.7	1241.94	90.91
1.738	196.3	1242.31	90.94
1.740	190.5	1242.69	90.97
1.742	190.2	1243.07	90.99
1.744	190.7	1243.45	91.02
1.746	186.7	1243.83	91.05

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.748	187.2	1244.20	91.08
1.750	185.8	1244.57	91.10
1.752	185.0	1244.94	91.13
1.754	185.6	1245.31	91.16
1.756	184.9	1245.68	91.19
1.758	184.3	1246.05	91.21
1.760	183.1	1246.42	91.24
1.762	179.3	1246.78	91.27
1.764	180.7	1247.14	91.29
1.766	181.7	1247.51	91.32
1.768	180.2	1247.87	91.35
1.770	179.1	1248.23	91.37
1.772	179.4	1248.59	91.40
1.774	179.2	1248.94	91.42
1.776	176.3	1249.30	91.45
1.778	174.7	1249.65	91.48
1.780	175.6	1250.00	91.50
1.782	174.7	1250.35	91.53
1.784	173.5	1250.70	91.55
1.786	173.9	1251.05	91.58
1.788	174.7	1251.40	91.60
1.790	173.3	1251.74	91.63
1.792	172.1	1252.09	91.65
1.794	170.9	1252.43	91.68
1.796	170.6	1252.77	91.70
1.798	170.3	1253.11	91.73
1.800	169.9	1253.45	91.75
1.802	167.2	1253.79	91.78
1.804	168.8	1254.13	91.80
1.806	168.8	1254.47	91.83
1.808	168.5	1254.80	91.85
1.810	168.6	1255.14	91.88
1.812	167.5	1255.48	91.90
1.814	165.8	1255.81	91.93

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.816	160.5	1256.14	91.95
1.818	152.0	1256.45	91.97
1.820	159.6	1256.76	92.00
1.822	159.8	1257.08	92.02
1.824	162.4	1257.40	92.04
1.826	162.8	1257.73	92.07
1.828	161.1	1258.05	92.09
1.830	160.6	1258.37	92.11
1.832	159.3	1258.69	92.14
1.834	158.5	1259.01	92.16
1.836	158.1	1259.33	92.18
1.838	156.2	1259.64	92.21
1.840	156.2	1259.95	92.23
1.842	154.0	1260.26	92.25
1.844	154.1	1260.57	92.28
1.846	153.5	1260.88	92.30
1.848	151.0	1261.18	92.32
1.850	154.6	1261.49	92.34
1.852	153.4	1261.80	92.37
1.854	152.5	1262.10	92.39
1.856	150.9	1262.41	92.41
1.858	152.5	1262.71	92.43
1.860	150.3	1263.01	92.45
1.862	150.4	1263.32	92.48
1.864	150.9	1263.62	92.50
1.866	149.4	1263.92	92.52
1.868	149.2	1264.22	92.54
1.870	150.8	1264.52	92.56
1.872	147.3	1264.81	92.59
1.874	140.1	1265.10	92.61
1.876	129.9	1265.37	92.63
1.878	144.1	1265.65	92.65
1.880	146.2	1265.94	92.67
1.882	147.4	1266.23	92.69

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.884	146.4	1266.52	92.71
1.886	143.9	1266.81	92.73
1.888	145.3	1267.10	92.75
1.890	142.4	1267.39	92.77
1.892	140.8	1267.67	92.80
1.894	139.6	1267.95	92.82
1.896	137.3	1268.23	92.84
1.898	139.0	1268.51	92.86
1.900	139.7	1268.78	92.88
1.902	140.9	1269.07	92.90
1.904	138.6	1269.34	92.92
1.906	139.0	1269.62	92.94
1.908	137.7	1269.90	92.96
1.910	137.8	1270.17	92.98
1.912	135.4	1270.45	93.00
1.914	137.0	1270.72	93.02
1.916	136.0	1270.99	93.04
1.918	135.3	1271.26	93.06
1.920	133.3	1271.53	93.08
1.922	135.0	1271.80	93.10
1.924	134.1	1272.07	93.12
1.926	134.4	1272.34	93.14
1.928	132.2	1272.60	93.16
1.930	131.3	1272.87	93.18
1.932	130.8	1273.13	93.19
1.934	132.0	1273.39	93.21
1.936	132.8	1273.66	93.23
1.938	132.1	1273.92	93.25
1.940	129.9	1274.18	93.27
1.942	129.4	1274.44	93.29
1.944	120.3	1274.69	93.31
1.946	119.2	1274.93	93.33
1.948	127.1	1275.18	93.34
1.950	126.1	1275.43	93.36

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
1.952	125.5	1275.68	93.38
1.954	128.6	1275.94	93.40
1.956	127.6	1276.19	93.42
1.958	127.1	1276.45	93.44
1.960	126.1	1276.70	93.46
1.962	124.0	1276.95	93.47
1.964	122.2	1277.20	93.49
1.966	123.1	1277.44	93.51
1.968	124.0	1277.69	93.53
1.970	123.9	1277.94	93.55
1.972	121.3	1278.18	93.56
1.974	120.8	1278.43	93.58
1.976	122.4	1278.67	93.60
1.978	119.4	1278.91	93.62
1.980	119.6	1279.15	93.64
1.982	120.5	1279.39	93.65
1.984	119.7	1279.63	93.67
1.986	117.8	1279.87	93.69
1.988	119.5	1280.10	93.71
1.990	119.8	1280.34	93.72
1.992	118.0	1280.58	93.74
1.994	116.2	1280.82	93.76
1.996	117.3	1281.05	93.77
1.998	115.9	1281.28	93.79
2.000	117.0	1281.52	93.81
2.002	116.1	1281.75	93.83
2.004	114.8	1281.98	93.84
2.006	114.7	1282.21	93.86
2.008	115.4	1282.44	93.88
2.010	114.9	1282.67	93.89
2.012	114.5	1282.90	93.91
2.014	113.8	1283.13	93.93
2.016	113.7	1283.36	93.94
2.018	113.4	1283.58	93.96

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.020	111.6	1283.81	93.98
2.022	110.7	1284.03	93.99
2.024	111.6	1284.25	94.01
2.026	111.5	1284.47	94.02
2.028	110.7	1284.70	94.04
2.030	108.6	1284.92	94.06
2.032	109.8	1285.13	94.07
2.034	109.2	1285.35	94.09
2.036	108.3	1285.57	94.11
2.038	106.4	1285.79	94.12
2.040	107.8	1286.00	94.14
2.042	107.6	1286.22	94.15
2.044	107.6	1286.43	94.17
2.046	107.1	1286.65	94.18
2.048	106.3	1286.86	94.20
2.050	105.9	1287.07	94.22
2.052	104.7	1287.28	94.23
2.054	104.6	1287.49	94.25
2.056	104.6	1287.70	94.26
2.058	104.0	1287.91	94.28
2.060	102.8	1288.12	94.29
2.062	102.3	1288.32	94.31
2.064	100.5	1288.52	94.32
2.066	102.5	1288.73	94.34
2.068	101.9	1288.93	94.35
2.070	100.3	1289.13	94.37
2.072	100.4	1289.33	94.38
2.074	100.9	1289.54	94.40
2.076	100.6	1289.74	94.41
2.078	100.0	1289.94	94.42
2.080	98.78	1290.14	94.44
2.082	98.64	1290.33	94.45
2.084	97.72	1290.53	94.47
2.086	98.52	1290.73	94.48

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.088	98.35	1290.92	94.50
2.090	97.88	1291.12	94.51
2.092	95.67	1291.31	94.53
2.094	95.93	1291.51	94.54
2.096	95.80	1291.70	94.55
2.098	96.20	1291.89	94.57
2.100	96.06	1292.08	94.58
2.102	95.77	1292.27	94.60
2.104	95.59	1292.46	94.61
2.106	95.74	1292.66	94.62
2.108	95.13	1292.85	94.64
2.110	93.96	1293.04	94.65
2.112	94.52	1293.22	94.67
2.114	94.36	1293.41	94.68
2.116	93.31	1293.60	94.69
2.118	93.11	1293.79	94.71
2.120	92.75	1293.97	94.72
2.122	92.75	1294.16	94.73
2.124	91.89	1294.34	94.75
2.126	92.08	1294.53	94.76
2.128	92.25	1294.71	94.77
2.130	92.09	1294.90	94.79
2.132	92.10	1295.08	94.80
2.134	91.55	1295.26	94.81
2.136	90.12	1295.45	94.83
2.138	91.10	1295.63	94.84
2.140	90.83	1295.81	94.85
2.142	90.64	1295.99	94.87
2.144	90.06	1296.17	94.88
2.146	89.39	1296.35	94.89
2.148	89.79	1296.53	94.91
2.150	89.57	1296.71	94.92
2.152	89.13	1296.89	94.93
2.154	88.78	1297.07	94.95

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.156	88.74	1297.24	94.96
2.158	88.42	1297.42	94.97
2.160	87.81	1297.60	94.99
2.162	86.86	1297.77	95.00
2.164	84.56	1297.94	95.01
2.166	78.49	1298.11	95.02
2.168	83.00	1298.27	95.03
2.170	85.57	1298.44	95.05
2.172	85.91	1298.61	95.06
2.174	85.92	1298.78	95.07
2.176	85.32	1298.95	95.08
2.178	84.25	1299.12	95.10
2.180	84.97	1299.29	95.11
2.182	84.25	1299.46	95.12
2.184	84.57	1299.63	95.13
2.186	84.65	1299.80	95.15
2.188	82.77	1299.96	95.16
2.190	83.04	1300.13	95.17
2.192	83.77	1300.30	95.18
2.194	83.49	1300.46	95.20
2.196	83.18	1300.63	95.21
2.198	82.99	1300.80	95.22
2.200	82.65	1300.96	95.23
2.202	82.30	1301.13	95.24
2.204	82.11	1301.29	95.26
2.206	79.66	1301.45	95.27
2.208	79.66	1301.61	95.28
2.210	80.80	1301.77	95.29
2.212	81.05	1301.93	95.30
2.214	80.72	1302.10	95.31
2.216	79.94	1302.26	95.33
2.218	79.70	1302.42	95.34
2.220	79.97	1302.58	95.35
2.222	79.62	1302.74	95.36

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.224	79.26	1302.89	95.37
2.226	78.11	1303.05	95.38
2.228	78.26	1303.21	95.40
2.230	78.31	1303.37	95.41
2.232	78.15	1303.52	95.42
2.234	78.02	1303.68	95.43
2.236	77.58	1303.83	95.44
2.238	76.48	1303.99	95.45
2.240	76.39	1304.14	95.46
2.242	76.42	1304.29	95.48
2.244	76.24	1304.45	95.49
2.246	76.12	1304.60	95.50
2.248	75.20	1304.75	95.51
2.250	75.41	1304.90	95.52
2.252	75.12	1305.05	95.53
2.254	74.02	1305.20	95.54
2.256	74.22	1305.35	95.55
2.258	74.41	1305.50	95.56
2.260	74.21	1305.65	95.57
2.262	72.99	1305.79	95.59
2.264	73.29	1305.94	95.60
2.266	73.15	1306.09	95.61
2.268	73.27	1306.23	95.62
2.270	72.97	1306.38	95.63
2.272	72.77	1306.52	95.64
2.274	72.52	1306.67	95.65
2.276	72.39	1306.81	95.66
2.278	72.42	1306.96	95.67
2.280	71.65	1307.10	95.68
2.282	70.07	1307.24	95.69
2.284	71.25	1307.39	95.70
2.286	71.24	1307.53	95.71
2.288	71.27	1307.67	95.72
2.290	71.10	1307.81	95.73

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.292	70.67	1307.95	95.74
2.294	69.20	1308.09	95.75
2.296	69.08	1308.23	95.76
2.298	69.19	1308.37	95.77
2.300	69.53	1308.51	95.78
2.302	69.55	1308.65	95.79
2.304	69.31	1308.79	95.80
2.306	69.23	1308.93	95.81
2.308	69.01	1309.06	95.82
2.310	68.70	1309.20	95.84
2.312	68.67	1309.34	95.85
2.314	68.26	1309.48	95.86
2.316	67.79	1309.61	95.87
2.318	67.45	1309.75	95.87
2.320	67.68	1309.88	95.88
2.322	66.75	1310.02	95.89
2.324	65.36	1310.15	95.90
2.326	65.59	1310.28	95.91
2.328	66.29	1310.41	95.92
2.330	66.16	1310.54	95.93
2.332	65.84	1310.68	95.94
2.334	65.71	1310.81	95.95
2.336	65.36	1310.94	95.96
2.338	64.96	1311.07	95.97
2.340	65.20	1311.20	95.98
2.342	65.39	1311.33	95.99
2.344	65.09	1311.46	96.00
2.346	64.86	1311.59	96.01
2.348	64.72	1311.72	96.02
2.350	64.53	1311.85	96.03
2.352	62.89	1311.98	96.04
2.354	62.39	1312.10	96.05
2.356	62.82	1312.23	96.06
2.358	62.66	1312.35	96.07

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.360	63.08	1312.48	96.07
2.362	63.05	1312.61	96.08
2.364	62.95	1312.73	96.09
2.366	62.84	1312.86	96.10
2.368	62.63	1312.98	96.11
2.370	62.11	1313.11	96.12
2.372	62.07	1313.23	96.13
2.374	60.66	1313.35	96.14
2.376	61.64	1313.48	96.15
2.378	61.92	1313.60	96.16
2.380	61.72	1313.72	96.17
2.382	60.98	1313.85	96.17
2.384	58.85	1313.97	96.18
2.386	59.08	1314.08	96.19
2.388	60.04	1314.20	96.20
2.390	60.29	1314.32	96.21
2.392	60.08	1314.44	96.22
2.394	60.03	1314.56	96.23
2.396	59.96	1314.68	96.24
2.398	59.89	1314.80	96.25
2.400	59.44	1314.92	96.25
2.402	59.65	1315.04	96.26
2.404	59.45	1315.16	96.27
2.406	59.19	1315.28	96.28
2.408	59.15	1315.40	96.29
2.410	59.02	1315.52	96.30
2.412	58.94	1315.63	96.31
2.414	57.34	1315.75	96.31
2.416	55.99	1315.86	96.32
2.418	57.48	1315.98	96.33
2.420	57.70	1316.09	96.34
2.422	57.67	1316.21	96.35
2.424	57.26	1316.32	96.36
2.426	57.17	1316.44	96.36

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.428	57.12	1316.55	96.37
2.430	57.12	1316.67	96.38
2.432	57.02	1316.78	96.39
2.434	56.41	1316.89	96.40
2.436	56.18	1317.01	96.41
2.438	55.99	1317.12	96.41
2.440	56.39	1317.23	96.42
2.442	56.17	1317.34	96.43
2.444	56.03	1317.46	96.44
2.446	54.98	1317.57	96.45
2.448	54.57	1317.68	96.46
2.450	54.62	1317.79	96.46
2.452	54.32	1317.89	96.47
2.454	54.55	1318.00	96.48
2.456	53.70	1318.11	96.49
2.458	53.92	1318.22	96.50
2.460	54.57	1318.33	96.50
2.462	54.42	1318.44	96.51
2.464	54.35	1318.55	96.52
2.466	54.05	1318.65	96.53
2.468	53.90	1318.76	96.53
2.470	52.85	1318.87	96.54
2.472	53.30	1318.97	96.55
2.474	53.13	1319.08	96.56
2.476	53.43	1319.19	96.57
2.478	53.03	1319.29	96.57
2.480	51.77	1319.40	96.58
2.482	51.40	1319.50	96.59
2.484	52.19	1319.61	96.60
2.486	51.60	1319.71	96.60
2.488	51.69	1319.81	96.61
2.490	52.25	1319.92	96.62
2.492	51.98	1320.02	96.63
2.494	51.75	1320.12	96.63

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
2.496	51.52	1320.23	96.64
2.498	51.54	1320.33	96.65
2.500	51.55	1320.43	96.66
2.52	49.84	1321.45	96.73
2.54	48.14	1322.43	96.80
2.56	46.72	1323.38	96.87
2.58	45.50	1324.30	96.94
2.60	44.57	1325.20	97.01
2.62	43.05	1326.08	97.07
2.64	42.11	1326.93	97.13
2.66	40.79	1327.76	97.19
2.68	39.68	1328.56	97.25
2.70	38.67	1329.34	97.31
2.72	37.63	1330.11	97.37
2.74	36.63	1330.85	97.42
2.76	35.46	1331.57	97.47
2.78	34.68	1332.27	97.52
2.80	33.85	1332.96	97.57
2.82	32.97	1333.63	97.62
2.84	32.09	1334.28	97.67
2.86	31.19	1334.91	97.72
2.88	30.32	1335.52	97.76
2.90	29.69	1336.12	97.81
2.92	28.90	1336.71	97.85
2.94	28.17	1337.28	97.89
2.96	27.50	1337.84	97.93
2.98	26.82	1338.38	97.97
3.00	26.12	1338.91	98.01
3.02	25.47	1339.43	98.05
3.04	24.65	1339.93	98.08
3.06	24.22	1340.42	98.12
3.08	23.64	1340.89	98.15
3.10	23.06	1341.36	98.19
3.12	22.46	1341.82	98.22

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
3.14	21.98	1342.26	98.25
3.16	21.44	1342.70	98.29
3.18	20.96	1343.12	98.32
3.20	20.48	1343.53	98.35
3.22	20.00	1343.94	98.38
3.24	19.51	1344.33	98.41
3.26	19.07	1344.72	98.43
3.28	18.58	1345.10	98.46
3.30	18.02	1345.46	98.49
3.32	17.68	1345.82	98.52
3.34	17.37	1346.17	98.54
3.36	16.97	1346.51	98.57
3.38	16.59	1346.85	98.59
3.40	16.15	1347.18	98.61
3.42	15.84	1347.50	98.64
3.44	15.54	1347.81	98.66
3.46	15.20	1348.12	98.68
3.48	14.86	1348.42	98.71
3.50	14.56	1348.71	98.73
3.52	14.25	1349.00	98.75
3.54	13.93	1349.28	98.77
3.56	13.62	1349.56	98.79
3.58	13.34	1349.83	98.81
3.60	13.07	1350.09	98.83
3.62	12.81	1350.35	98.85
3.64	12.51	1350.60	98.87
3.66	12.22	1350.85	98.88
3.68	11.93	1351.09	98.9
3.70	11.62	1351.33	98.92
3.72	11.45	1351.56	98.94
3.74	11.08	1351.78	98.95
3.76	10.96	1352.00	98.97
3.78	10.78	1352.22	98.98
3.80	10.57	1352.43	99.000

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
3.82	10.38	1352.64	99.015
3.84	10.19	1352.85	99.030
3.86	9.983	1353.05	99.045
3.88	9.782	1353.25	99.059
3.90	9.599	1353.44	99.073
3.92	9.427	1353.63	99.087
3.94	9.233	1353.82	99.101
3.96	9.032	1354.00	99.114
3.98	8.857	1354.18	99.128
4.00	8.669	1354.36	99.140
4.02	8.557	1354.53	99.153
4.04	8.385	1354.70	99.165
4.06	8.217	1354.86	99.178
4.08	8.054	1355.03	99.189
4.10	7.894	1355.19	99.201
4.12	7.739	1355.34	99.213
4.14	7.587	1355.50	99.224
4.16	7.439	1355.65	99.235
4.18	7.294	1355.79	99.246
4.20	7.153	1355.94	99.256
4.22	7.015	1356.08	99.266
4.24	6.881	1356.22	99.277
4.26	6.749	1356.35	99.287
4.28	6.621	1356.49	99.296
4.30	6.496	1356.62	99.306
4.32	6.374	1356.75	99.315
4.34	6.254	1356.87	99.325
4.36	6.138	1357.00	99.334
4.38	6.024	1357.12	99.343
4.40	5.913	1357.24	99.351
4.42	5.804	1357.36	99.36
4.44	5.698	1357.47	99.368
4.46	5.594	1357.58	99.377
4.48	5.492	1357.70	99.385

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
4.50	5.393	1357.80	99.393
4.52	5.296	1357.91	99.401
4.54	5.201	1358.02	99.408
4.56	5.108	1358.12	99.416
4.58	5.018	1358.22	99.423
4.60	4.929	1358.32	99.430
4.62	4.842	1358.42	99.438
4.64	4.757	1358.51	99.445
4.66	4.674	1358.61	99.452
4.68	4.593	1358.70	99.458
4.70	4.514	1358.79	99.465
4.72	4.436	1358.88	99.472
4.74	4.360	1358.97	99.478
4.76	4.285	1359.06	99.484
4.78	4.212	1359.14	99.491
4.80	4.141	1359.22	99.497
4.82	4.071	1359.31	99.503
4.84	4.003	1359.39	99.509
4.86	3.936	1359.47	99.514
4.88	3.870	1359.54	99.520
4.90	3.806	1359.62	99.526
4.92	3.743	1359.70	99.531
4.94	3.681	1359.77	99.537
4.96	3.621	1359.84	99.542
4.98	3.562	1359.92	99.547
5.00	3.504	1359.99	99.552
5.05	3.394	1360.16	99.565
5.10	3.257	1360.33	99.577
5.15	3.146	1360.49	99.589
5.20	3.030	1360.64	99.600
5.25	2.920	1360.79	99.611
5.30	2.815	1360.93	99.622
5.35	2.715	1361.07	99.632
5.40	2.619	1361.20	99.642

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
5.45	2.527	1361.33	99.651
5.50	2.439	1361.46	99.660
5.55	2.355	1361.58	99.669
5.60	2.275	1361.69	99.677
5.65	2.198	1361.80	99.686
5.70	2.124	1361.91	99.693
5.75	2.054	1362.02	99.701
5.80	1.986	1362.12	99.708
5.85	1.921	1362.22	99.716
5.90	1.859	1362.31	99.723
5.95	1.799	1362.40	99.729
6.00	1.742	1362.49	99.736
6.05	1.687	1362.58	99.742
6.10	1.634	1362.66	99.748
6.15	1.583	1362.74	99.754
6.20	1.534	1362.82	99.760
6.25	1.487	1362.89	99.765
6.30	1.442	1362.97	99.771
6.35	1.399	1363.04	99.776
6.40	1.357	1363.11	99.781
6.45	1.317	1363.17	99.786
6.50	1.278	1363.24	99.790
6.55	1.240	1363.30	99.795
6.60	1.204	1363.36	99.800
6.65	1.170	1363.42	99.804
6.70	1.136	1363.48	99.808
6.75	1.104	1363.53	99.812
6.80	1.073	1363.59	99.816
6.85	1.043	1363.64	99.820
6.90	1.014	1363.69	99.824
6.95	0.9862	1363.74	99.827
7.00	0.9592	1363.79	99.831
7.05	0.9331	1363.84	99.834
7.10	0.9080	1363.89	99.838

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
7.15	0.8836	1363.93	99.841
7.20	0.8601	1363.97	99.844
7.25	0.8374	1364.02	99.847
7.30	0.8154	1364.06	99.850
7.35	0.7942	1364.10	99.853
7.40	0.7736	1364.14	99.856
7.45	0.7537	1364.17	99.859
7.50	0.7344	1364.21	99.862
7.55	0.7158	1364.25	99.864
7.60	0.6977	1364.28	99.867
7.65	0.6802	1364.32	99.870
7.70	0.6633	1364.35	99.872
7.75	0.6469	1364.38	99.874
7.80	0.6310	1364.42	99.877
7.85	0.6156	1364.45	99.879
7.90	0.6006	1364.48	99.881
7.95	0.5862	1364.51	99.883
8.00	0.5721	1364.54	99.886
8.05	0.5585	1364.56	99.888
8.10	0.5453	1364.59	99.890
8.15	0.5324	1364.62	99.892
8.20	0.5200	1364.65	99.894
8.25	0.5079	1364.67	99.895
8.30	0.4961	1364.70	99.897
8.35	0.4847	1364.72	99.899
8.40	0.4737	1364.74	99.901
8.45	0.4629	1364.77	99.903
8.50	0.4525	1364.79	99.904
8.55	0.4423	1364.81	99.906
8.60	0.4324	1364.84	99.907
8.65	0.4228	1364.86	99.909
8.70	0.4135	1364.88	99.911
8.75	0.4044	1364.90	99.912
8.80	0.3956	1364.92	99.913

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
8.85	0.3870	1364.94	99.915
8.90	0.3787	1364.96	99.916
8.95	0.3706	1364.98	99.918
9.00	0.3627	1364.99	99.919
9.05	0.3550	1365.01	99.920
9.10	0.3475	1365.03	99.922
9.15	0.3402	1365.05	99.923
9.20	0.3331	1365.06	99.924
9.25	0.3262	1365.08	99.925
9.30	0.3195	1365.10	99.927
9.35	0.3129	1365.11	99.928
9.40	0.3065	1365.13	99.929
9.45	0.3003	1365.14	99.930
9.50	0.2942	1365.16	99.931
9.55	0.2883	1365.17	99.932
9.60	0.2825	1365.19	99.933
9.65	0.2769	1365.20	99.934
9.70	0.2714	1365.21	99.935
9.75	0.2661	1365.23	99.936
9.80	0.2608	1365.24	99.937
9.85	0.2558	1365.25	99.938
9.90	0.2508	1365.27	99.939
9.95	0.2460	1365.28	99.940
10	0.2412	1365.29	99.941
11	0.1635	1365.49	99.956
12	0.1152	1365.63	99.966
13	8.341×10^{-2}	1365.73	99.973
14	6.188×10^{-2}	1365.80	99.978
15	4.686×10^{-2}	1365.86	99.982
16	3.613×10^{-2}	1365.90	99.985
17	2.830×10^{-2}	1365.93	99.988
18	2.247×10^{-2}	1365.96	99.9896
19	1.807×10^{-2}	1365.98	99.9911
20	1.470×10^{-2}	1365.99	99.9923
25	6.054×10^{-3}	1366.046	99.9961

表 1 零大气质量下太阳光谱辐照度(续)

$\lambda/\mu\text{m}$	$E_{\lambda}/\text{W} \cdot \text{m}^{-2} \cdot \mu\text{m}^{-1}$	$E_{0-\lambda}/\text{W} \cdot \text{m}^{-2}$	$D_{0-\lambda}/\%$
30	2.928×10^{-3}	1366.069	99.9977
35	1.584×10^{-3}	1366.080	99.9985
40	9.307×10^{-4}	1366.086	99.999
50	3.826×10^{-4}	1366.093	99.9995
60	1.850×10^{-4}	1366.096	99.9997
80	5.882×10^{-5}	1366.098	99.99987
100	2.418×10^{-5}	1366.099	99.99993
120	1.169×10^{-5}	1366.0995	99.99996
150	4.807×10^{-6}	1366.0997	99.99998
200	1.528×10^{-6}	1366.09987	99.999991
250	6.275×10^{-7}	1366.09993	99.999995
300	2.950×10^{-7}	1366.09995	99.999996
400	1.014×10^{-7}	1366.09997	99.999998
1000	3.384×10^{-9}	1366.1	100

附 录 A
(资料性附录)
太阳常数单位换算

$$\begin{aligned}
 \text{太阳常数} &= 1366.1 \text{ W} \cdot \text{m}^{-2} [\text{国际单位制}] \\
 &= 0.13661 \text{ W} \cdot \text{cm}^{-2} \\
 &= 136.61 \text{ mW} \cdot \text{cm}^{-2} \\
 &= 1.3661 \times 10^6 \text{ erg} \cdot \text{cm}^{-2} \cdot \text{s}^{-1} \\
 &= 126.9 \text{ W} \cdot \text{ft}^{-2} \\
 &= 1.959 \text{ cal} \cdot \text{cm}^{-2} \cdot \text{min}^{-1} (\pm 0.03 \text{ cal} \cdot \text{cm}^{-2} \cdot \text{min}^{-1}) \\
 &= 0.0326 \text{ cal} \cdot \text{cm}^{-2} \cdot \text{s}^{-1} \\
 &= 433.4 \text{ Btu} \cdot \text{ft}^{-2} \cdot \text{h}^{-1} \\
 &= 0.1202 \text{ Btu} \cdot \text{ft}^{-2} \cdot \text{s}^{-1} \\
 &= 1.956 \text{ Langley} \cdot \text{min}^{-1}
 \end{aligned}$$

calorie 是热化学上的 calorie-gram, 热量单位, 量纲符号为 cal, 1 cal 等于 4.1840 绝对焦耳。

Btu 是热化学上的英制热量单位, 其换算关系为: $1 \text{ Btu (热化学)} \cdot \text{F}^{-1} \cdot \text{lb}^{-1} = 1 \text{ cal} \cdot \text{g (热化学)} \cdot \text{C}^{-1} \cdot \text{g}^{-1}$ 。

Langley 是根据旧的热量单位 calorie · g (mean) 定义的, 即 $1 \text{ Langley} = 1 \text{ cal} \cdot \text{g (mean)} \cdot \text{cm}^{-2}$, $1 \text{ cal} \cdot \text{g (mean)} = 4.19002 \text{ J}$ 。

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