



UL Verification Services Inc.  
7036 Snowdrift Road  
Allentown, PA 18106  
610-774-1300

## Integrating Sphere Test Report

Relevant Standards  
IES LM-79-2008  
ANSI C78.377-2011, ANSI C82.77-2002  
CIE 13.3-1995, CIE 15-2004

Prepared For  
Elemental LED Inc, DBA Diode LED  
Wes Buck  
Suite 211, 1195 Park Ave.  
Emeryville, CA 94608  
United States

Catalog Number  
SPOTMOD™ 12V LED Fixture & Recessed Gimbal Fixture DI-SPOT-XX30-44-YY

Order Number  
10461972  
Test Number  
748178

Test Date  
2014-09-19

Prepared By

*Javier Caban*

Javier Caban, Technician

Approved By

*Eric M. Gaudreau*

Eric Gaudreau, Engineering Project Handler

The results contained in this report pertain only to the tested sample.  
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Luminaire Description: Aluminum housing, plastic patterned enclosure  
Catalog Number: SPOTMOD™ 12V LED Fixture & Recessed Gimbal Fixture DI-SPOT-XX30-44-YY  
Lamp: Three white LEDs with optics below each  
Mounting: Surface  
Ballast/Driver: One Meanwell LPV-60-12

Luminaire



#### Summary of Results

Radiant Flux:	423.0 mW
Luminous Flux:	130.8 Lumens
Luminaire Efficacy:	42.1 Lumens/Watt
CCT:	3041 K
CRI (Ra):	82.8
Chromaticity (x):	0.4306
Chromaticity (y):	0.3961
Chromaticity (u):	0.2499
Chromaticity (v):	0.3448
Duv:	-0.0024

#### Test Conditions

Test Temperature:	24.5 °C
Voltage:	120.0 VAC
Current:	0.06743 A
Power:	3.110 W
Power Factor:	0.384
Frequency:	60 Hz
Current THD:	183 %

Testing was performed in a 1-meter integrating sphere using the 4 $\pi$  geometry method.

Absorption correction was employed for this measurement.

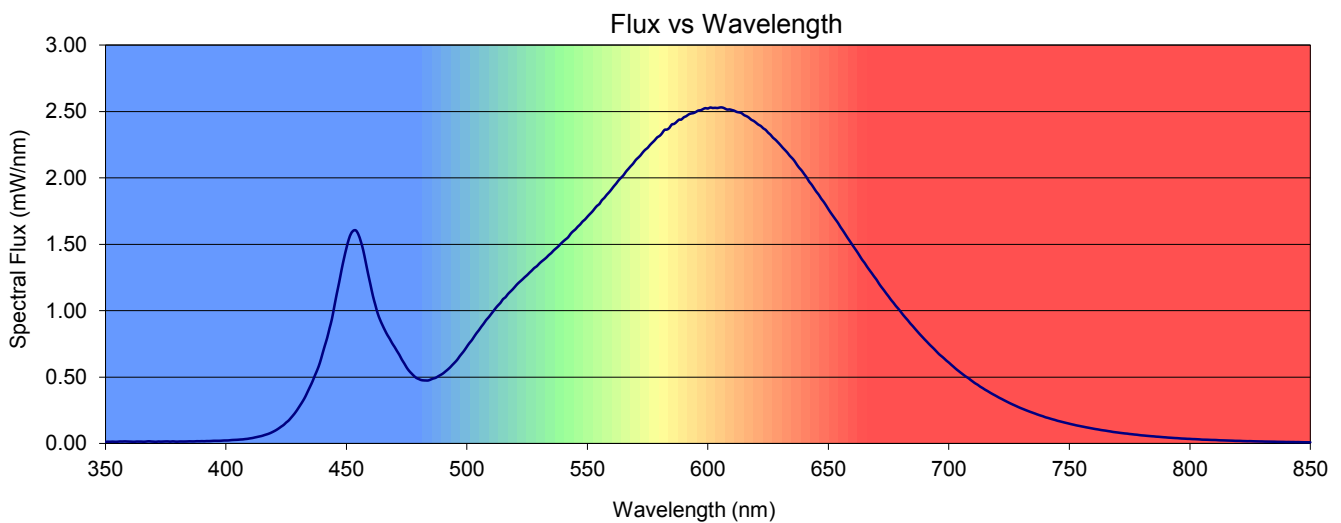
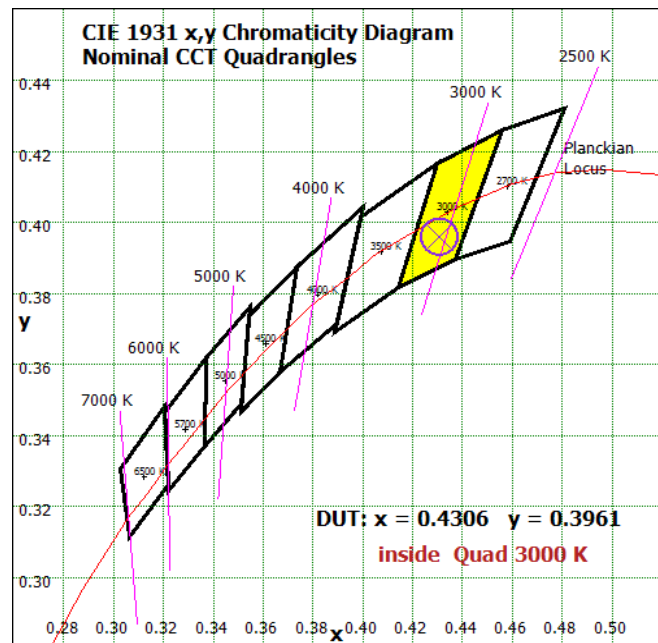
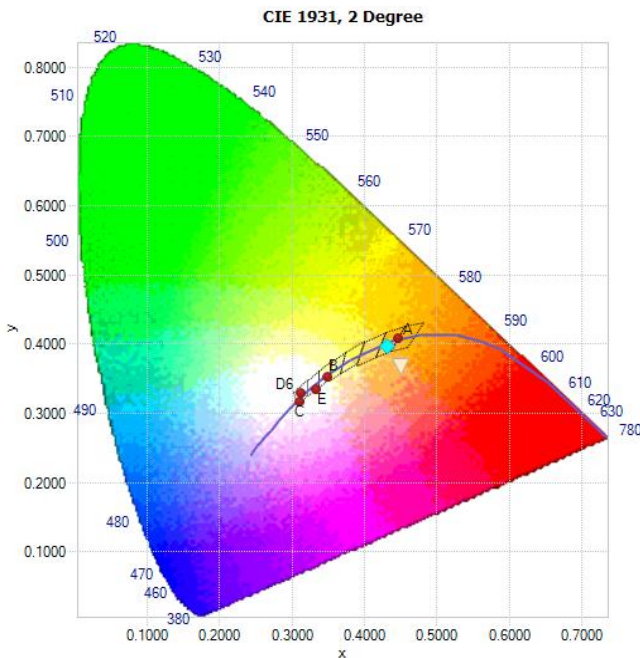


Chromaticity Coordinates

x	y	u	v	u'	v'	Duv
0.4306	0.3961	0.2499	0.3448	0.2499	0.5173	-0.0024

Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
82.8	81.2	90.1	95.7	79.5	80.5	86.1	84.8	64.5	19.7	76.2	76.7	66.9	83.1	97.7





Spectral Power Distribution

$\lambda$ (nm)	mW/nm	$\lambda$ (nm)	mW/nm	$\lambda$ (nm)	mW/nm	$\lambda$ (nm)	mW/nm	$\lambda$ (nm)	mW/nm	$\lambda$ (nm)	mW/nm	$\lambda$ (nm)	mW/nm
350	0.0126	422	0.115	494	0.592	566	2.05	638	2.07	710	0.465	782	0.0583
351	0.0136	423	0.128	495	0.611	567	2.07	639	2.05	711	0.452	783	0.0567
352	0.0132	424	0.140	496	0.631	568	2.09	640	2.03	712	0.442	784	0.0549
353	0.0140	425	0.158	497	0.656	569	2.11	641	2.00	713	0.428	785	0.0538
354	0.0130	426	0.173	498	0.679	570	2.13	642	1.97	714	0.418	786	0.0518
355	0.0134	427	0.193	499	0.702	571	2.15	643	1.95	715	0.406	787	0.0507
356	0.0152	428	0.214	500	0.729	572	2.17	644	1.92	716	0.396	788	0.0493
357	0.0149	429	0.238	501	0.755	573	2.19	645	1.90	717	0.384	789	0.0475
358	0.0160	430	0.265	502	0.777	574	2.21	646	1.87	718	0.374	790	0.0463
359	0.0150	431	0.293	503	0.804	575	2.23	647	1.84	719	0.364	791	0.0445
360	0.0145	432	0.322	504	0.831	576	2.25	648	1.82	720	0.354	792	0.0435
361	0.0137	433	0.354	505	0.854	577	2.27	649	1.79	721	0.344	793	0.0421
362	0.0131	434	0.393	506	0.880	578	2.28	650	1.76	722	0.335	794	0.0410
363	0.0146	435	0.431	507	0.903	579	2.31	651	1.74	723	0.325	795	0.0401
364	0.0144	436	0.470	508	0.929	580	2.32	652	1.71	724	0.316	796	0.0385
365	0.0142	437	0.515	509	0.950	581	2.34	653	1.69	725	0.307	797	0.0373
366	0.0133	438	0.557	510	0.973	582	2.36	654	1.66	726	0.298	798	0.0366
367	0.0148	439	0.608	511	0.997	583	2.36	655	1.63	727	0.290	799	0.0353
368	0.0166	440	0.671	512	1.02	584	2.38	656	1.60	728	0.281	800	0.0349
369	0.0150	441	0.733	513	1.04	585	2.40	657	1.58	729	0.273	801	0.0335
370	0.0140	442	0.794	514	1.06	586	2.41	658	1.55	730	0.265	802	0.0331
371	0.0130	443	0.867	515	1.09	587	2.42	659	1.52	731	0.258	803	0.0321
372	0.0150	444	0.937	516	1.10	588	2.44	660	1.49	732	0.251	804	0.0311
373	0.0141	445	1.03	517	1.12	589	2.44	661	1.47	733	0.244	805	0.0293
374	0.0149	446	1.13	518	1.14	590	2.46	662	1.44	734	0.237	806	0.0289
375	0.0156	447	1.21	519	1.16	591	2.46	663	1.41	735	0.230	807	0.0284
376	0.0156	448	1.31	520	1.18	592	2.48	664	1.38	736	0.224	808	0.0278
377	0.0143	449	1.39	521	1.20	593	2.48	665	1.36	737	0.217	809	0.0270
378	0.0162	450	1.47	522	1.22	594	2.49	666	1.33	738	0.211	810	0.0266
379	0.0144	451	1.54	523	1.23	595	2.50	667	1.31	739	0.205	811	0.0261
380	0.0141	452	1.58	524	1.25	596	2.51	668	1.28	740	0.198	812	0.0246
381	0.0153	453	1.60	525	1.27	597	2.51	669	1.26	741	0.193	813	0.0239
382	0.0150	454	1.60	526	1.29	598	2.52	670	1.23	742	0.188	814	0.0234
383	0.0150	455	1.57	527	1.30	599	2.52	671	1.20	743	0.182	815	0.0228
384	0.0157	456	1.52	528	1.32	600	2.52	672	1.18	744	0.178	816	0.0223
385	0.0164	457	1.45	529	1.33	601	2.53	673	1.16	745	0.172	817	0.0217
386	0.0159	458	1.37	530	1.35	602	2.53	674	1.13	746	0.167	818	0.0210
387	0.0161	459	1.28	531	1.37	603	2.53	675	1.11	747	0.163	819	0.0202
388	0.0175	460	1.20	532	1.38	604	2.53	676	1.08	748	0.158	820	0.0199
389	0.0170	461	1.11	533	1.40	605	2.53	677	1.06	749	0.154	821	0.0197
390	0.0179	462	1.04	534	1.42	606	2.53	678	1.04	750	0.149	822	0.0185
391	0.0172	463	0.979	535	1.43	607	2.52	679	1.02	751	0.145	823	0.0181
392	0.0185	464	0.931	536	1.45	608	2.51	680	0.993	752	0.141	824	0.0175
393	0.0183	465	0.890	537	1.47	609	2.52	681	0.969	753	0.136	825	0.0179
394	0.0193	466	0.852	538	1.49	610	2.51	682	0.947	754	0.133	826	0.0171
395	0.0204	467	0.817	539	1.50	611	2.51	683	0.927	755	0.129	827	0.0165
396	0.0204	468	0.788	540	1.52	612	2.50	684	0.904	756	0.126	828	0.0161
397	0.0206	469	0.755	541	1.54	613	2.49	685	0.884	757	0.122	829	0.0156
398	0.0211	470	0.727	542	1.55	614	2.49	686	0.863	758	0.119	830	0.0154
399	0.0226	471	0.696	543	1.58	615	2.47	687	0.842	759	0.115	831	0.0147
400	0.0230	472	0.667	544	1.60	616	2.46	688	0.822	760	0.112	832	0.0144
401	0.0233	473	0.632	545	1.61	617	2.45	689	0.802	761	0.108	833	0.0142
402	0.0254	474	0.604	546	1.63	618	2.44	690	0.783	762	0.106	834	0.0138
403	0.0268	475	0.572	547	1.65	619	2.43	691	0.764	763	0.102	835	0.0136
404	0.0274	476	0.548	548	1.67	620	2.41	692	0.745	764	0.0994	836	0.0129
405	0.0285	477	0.528	549	1.69	621	2.40	693	0.727	765	0.0969	837	0.0126
406	0.0300	478	0.510	550	1.71	622	2.39	694	0.710	766	0.0937	838	0.0123
407	0.0311	479	0.494	551	1.73	623	2.37	695	0.690	767	0.0912	839	0.0120
408	0.0334	480	0.486	552	1.75	624	2.36	696	0.672	768	0.0876	840	0.0113
409	0.0354	481	0.478	553	1.77	625	2.34	697	0.657	769	0.0851	841	0.0116
410	0.0385	482	0.475	554	1.79	626	2.32	698	0.641	770	0.0830	842	0.0111
411	0.0413	483	0.475	555	1.80	627	2.30	699	0.624	771	0.0804	843	0.0112
412	0.0455	484	0.475	556	1.83	628	2.29	700	0.610	772	0.0782	844	0.0105
413	0.0494	485	0.482	557	1.85	629	2.27	701	0.593	773	0.0760	845	0.0109
414	0.0535	486	0.489	558	1.87	630	2.25	702	0.577	774	0.0744	846	0.0101
415	0.0575	487	0.494	559	1.89	631	2.23	703	0.561	775	0.0717	847	0.00953
416	0.0636	488	0.505	560	1.91	632	2.21	704	0.546	776	0.0700	848	0.00920
417	0.0690	489	0.515	561	1.94	633	2.19	705	0.532	777	0.0677	849	0.00916
418	0.0755	490	0.526	562	1.96	634	2.17	706	0.518	778	0.0662	850	0.00919
419	0.0836	491	0.541	563	1.98	635	2.15	707	0.505	779	0.0636		
420	0.0926	492	0.556	564	2.00	636	2.13	708	0.493	780	0.0614		
421	0.103	493	0.573	565	2.02	637	2.10	709	0.479	781	0.0601		



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## Photometric Indoor Test Report

Relevant Standards  
IES LM-79-2008  
ANSI C82.77-2002

Prepared For  
Elemental LED Inc, DBA Diode LED  
Wes Buck  
Suite 211, 1195 Park Ave.  
Emeryville, CA 94608  
United States

Catalog Number  
SPOTMOD™ 12V LED Fixture & Recessed Gimbal Fixture DI-SPOT-XX30-44-YY  
Project Number  
10461972  
Test Number  
748177

Test Date

2014-09-19

Prepared By

Handwritten signature of Javier Caban in black ink.

Javier Caban, Technician

Approved By

Handwritten signature of Eric M. Gaudreau in black ink.

Eric Gaudreau, Engineering Project Handler

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Luminaire Description: Aluminum housing, plastic patterned enclosure  
Catalog Number: SPOTMOD™ 12V LED Fixture & Recessed Gimbal Fixture DI-SPOT-XX30-44-YY  
Lamp: Three white LEDs with optics below each  
Mounting: Surface  
Ballast/Driver: One Meanwell LPV-60-12

Luminaire

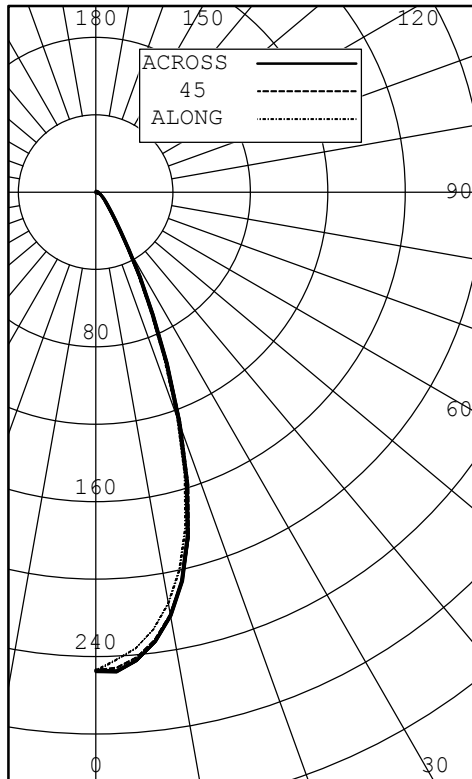


Test Conditions

Test Temperature:	24.2 °C
Voltage:	120.0 VAC
Current:	0.06319 A
Power:	3.091 W
Power Factor:	0.408
Frequency:	60 Hz
Current THD:	171 %



INTENSITY (CANDLEPOWER) SUMMARY OUTPUT LUMENS



ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	247	247	247	247	247	
5	237	239	241	243	243	23
10	216	219	222	223	222	
15	179	182	185	185	184	49
20	123	124	128	127	126	
25	66	68	70	69	70	32
30	32	33	33	34	34	
35	16	17	17	18	18	11
40	10	10	11	11	11	
45	7	7	7	7	7	6
50	6	5	6	6	5	
55	4	4	4	4	4	4
60	3	3	3	3	3	
65	3	3	3	3	3	3
70	2	2	2	2	2	
75	1	1	1	1	1	1
80	1	1	1	1	1	
85	0	0	0	0	0	0
90	0	0	0	0	0	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	104	80.16
0-40	115	89.03
0-60	125	96.49
0-90	130	100.00
40-90	14	10.97
60-90	5	3.51
90-180	0	0.00
0-180	130	100.00

EFFICACY (LUMENS PER WATT): 41.8

\*\*\* THIS IS AN ABSOLUTE TEST \*\*\*

LUMINOUS DIAMETER: 0.875 INS

LUMINANCE SUMMARY CD./SQ.M.

S/MH: 0.7  
 SC: 0.7

ANGLE	ALONG	45	ACROSS
45	26428	27078	26712
55	19324	19398	19172
65	16772	16526	15612
75	13445	13959	13496
85	11830	10378	10391

TESTED IN ACCORDANCE WITH IES PROCEDURES.





INTENSITY (CANDLEPOWER) DATA  
IN 2.5 DEGREE STEPS

ANGLE	PLANE						OUTPUT LUMENS
	ALONG	22.5	45	67.5	ACROSS	AVERAGE	
0.0	247	247	247	247	247	247	
2.5	242	244	246	247	248	246	
5.0	237	239	241	243	243	241	23
7.5	228	231	233	234	234	232	
10.0	216	219	222	223	222	221	
12.5	200	203	206	207	206	205	
15.0	179	182	185	185	184	183	49
17.5	153	155	159	158	157	157	
20.0	123	124	128	127	126	126	
22.5	92	94	96	96	96	95	
25.0	66	68	70	69	70	69	32
27.5	46	47	48	49	49	48	
30.0	32	33	33	34	34	33	
32.5	22	23	23	24	24	23	
35.0	16	17	17	18	18	17	11
37.5	13	13	13	13	13	13	
40.0	10	10	11	11	11	10	
42.5	9	8	9	9	9	9	
45.0	7	7	7	7	7	7	6
47.5	6	6	6	6	6	6	
50.0	6	5	6	6	5	6	
52.5	5	5	5	5	5	5	
55.0	4	4	4	4	4	4	4
57.5	4	4	4	4	4	4	
60.0	3	3	3	3	3	3	
62.5	3	3	3	3	3	3	
65.0	3	3	3	3	3	3	3
67.5	2	2	2	2	2	2	
70.0	2	2	2	2	2	2	
72.5	2	2	2	2	2	2	
75.0	1	1	1	1	1	1	1
77.5	1	1	1	1	1	1	
80.0	1	1	1	1	1	1	
82.5	1	1	1	1	1	1	
85.0	0	0	0	0	0	0	0
87.5	0	0	0	0	0	0	
90.0	0	0	0	0	0	0	





COEFFICIENTS OF UTILIZATION

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	90				80				70				50				30				10				0	
	70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0	
RCR	0	1.221	.221	.221	.22	1.191	.191	.191	.19	1.161	.161	.161	.16	1.111	.111	.111	.11	1.061	.061	.061	.06	1.021	.021	.021	.02	1.00
	1	1.171	.141	.121	.09	1.141	.121	.101	.08	1.121	.101	.081	.06	1.061	.041	.03	1.021	.011	.00	0.990	.980	.97	0.95			
	2	1.121	.081	.041	.01	1.101	.061	.031	.00	1.081	.041	.010	.99	1.010	.990	.96	0.980	.960	.94	0.950	.940	.92	0.91			
	3	1.071	.020	.980	.94	1.061	.010	.970	.93	1.040	.990	.960	.93	0.970	.940	.91	0.950	.920	.90	0.930	.910	.89	0.87			
	4	1.040	.970	.920	.89	1.020	.960	.920	.89	1.010	.950	.910	.88	0.930	.900	.87	0.910	.880	.86	0.900	.870	.85	0.84			
	5	1.000	.930	.880	.84	0.990	.920	.870	.84	0.970	.910	.870	.84	0.890	.860	.83	0.880	.850	.82	0.860	.840	.81	0.80			
	6	0.970	.890	.840	.81	0.950	.890	.840	.81	0.940	.880	.830	.80	0.860	.830	.80	0.850	.820	.79	0.840	.810	.79	0.78			
	7	0.930	.850	.800	.78	0.920	.850	.800	.77	0.910	.840	.800	.77	0.830	.790	.76	0.820	.780	.76	0.810	.780	.75	0.74			
	8	0.910	.820	.770	.74	0.890	.820	.770	.74	0.880	.810	.770	.74	0.800	.760	.73	0.790	.760	.73	0.780	.750	.73	0.72			
	9	0.870	.790	.740	.71	0.860	.790	.740	.71	0.850	.780	.740	.71	0.770	.730	.71	0.770	.730	.70	0.760	.730	.70	0.69			
	10	0.840	.760	.720	.68	0.840	.760	.720	.68	0.830	.760	.720	.68	0.750	.710	.68	0.740	.710	.68	0.740	.700	.68	0.67			

THE ABOVE COEFFICIENTS HAVE BEEN CALCULATED BASED ON LUMINAIRE LUMENS  
 BECAUSE IN AN ABSOLUTE TEST THE BARE LAMP LUMENS ARE UNKNOWN.  
 LIGHTING DESIGN CALCULATIONS MADE USING THESE COEFFICIENTS SHOULD  
 THEREFORE USE THE LUMINAIRE LUMENS IN THE CALCULATION FORMULA

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE.  
 BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST  
 LUMINOUS OPENING OF LUMINAIRE.



## Cone of Light

**Cone Of Light Tabulation**

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	15.5	2.66
6.00	6.88	3.99
8.00	3.87	5.32
10.0	2.48	6.65
12.0	1.72	7.98
14.0	1.26	9.31
16.0	0.968	10.6

**Cone of Light Plot**

