



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-XX30-15-YY

Order Number  
10461972  
Test Number  
748182

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-XX30-15-YY  
Lamp: Three white LEDs with optics below each  
Mounting: Surface  
Ballast/Driver: One Meanwell LPV-60-12

Luminaire



#### Summary of Results

Radiant Flux:	443.8 mW
Luminous Flux:	136.7 Lumens
Luminaire Efficacy:	42.6 Lumens/Watt
CCT:	3026 K
CRI (Ra):	82.8
Chromaticity (x):	0.4310
Chromaticity (y):	0.3952
Chromaticity (u):	0.2506
Chromaticity (v):	0.3446
Duv:	-0.0029

#### Test Conditions

Test Temperature:	25.3 °C
Voltage:	120.0 VAC
Current:	0.06925 A
Power:	3.210 W
Power Factor:	0.387
Frequency:	60 Hz
Current THD:	184 %

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

Absorption correction was employed for this measurement.

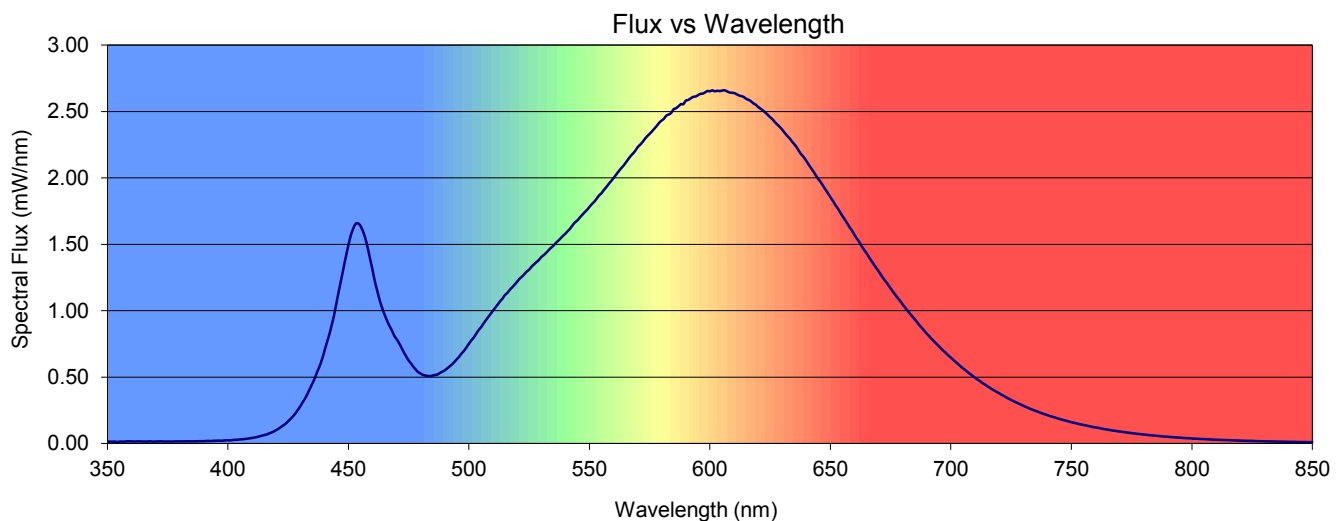
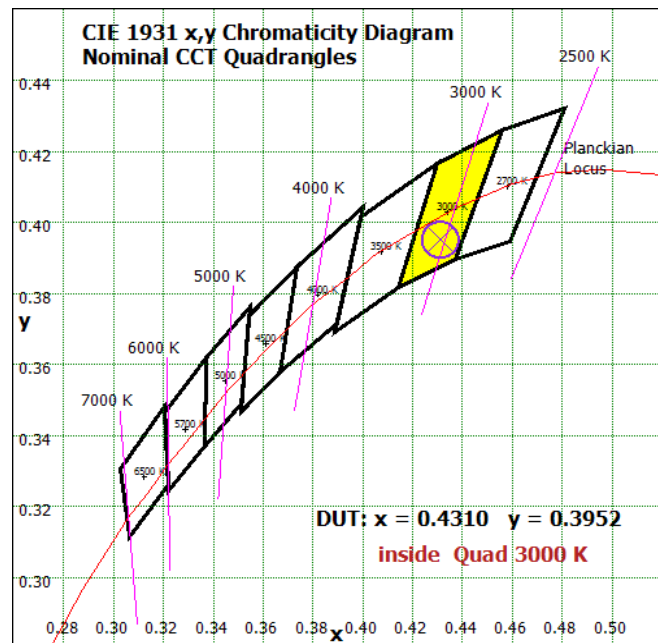
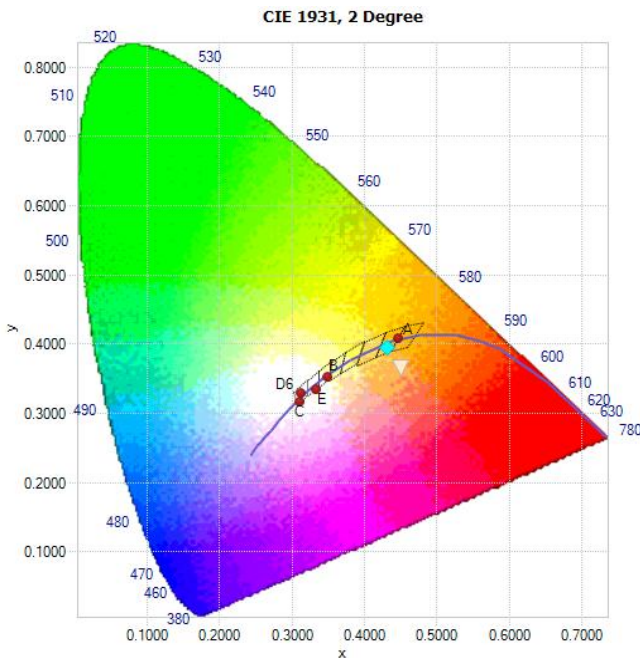


Chromaticity Coordinates

x	y	u	v	u'	v'	Duv
0.4310	0.3952	0.2506	0.3446	0.2506	0.5169	-0.0029

Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
82.8	81.3	90.4	95.8	79.2	80.6	86.4	84.5	64.2	19.7	76.8	76.2	67.6	83.3	97.8





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	0.0115	422	0.123	494	0.614	566	2.14	638	2.18	710	0.495	782	0.0637
351	0.0146	423	0.137	495	0.635	567	2.16	639	2.15	711	0.483	783	0.0620
352	0.0134	424	0.150	496	0.655	568	2.18	640	2.13	712	0.470	784	0.0601
353	0.0149	425	0.168	497	0.679	569	2.20	641	2.10	713	0.457	785	0.0586
354	0.0114	426	0.186	498	0.699	570	2.23	642	2.07	714	0.445	786	0.0569
355	0.0143	427	0.205	499	0.724	571	2.25	643	2.05	715	0.434	787	0.0552
356	0.0144	428	0.227	500	0.751	572	2.27	644	2.02	716	0.421	788	0.0533
357	0.0139	429	0.252	501	0.776	573	2.29	645	1.99	717	0.409	789	0.0521
358	0.0167	430	0.278	502	0.798	574	2.31	646	1.97	718	0.400	790	0.0506
359	0.0162	431	0.310	503	0.825	575	2.33	647	1.94	719	0.389	791	0.0493
360	0.0165	432	0.338	504	0.853	576	2.35	648	1.91	720	0.378	792	0.0479
361	0.0151	433	0.373	505	0.874	577	2.37	649	1.88	721	0.368	793	0.0467
362	0.0155	434	0.412	506	0.902	578	2.39	650	1.85	722	0.358	794	0.0454
363	0.0166	435	0.450	507	0.928	579	2.42	651	1.83	723	0.347	795	0.0442
364	0.0152	436	0.489	508	0.951	580	2.43	652	1.80	724	0.337	796	0.0423
365	0.0151	437	0.537	509	0.976	581	2.45	653	1.77	725	0.328	797	0.0412
366	0.0143	438	0.579	510	1.000	582	2.47	654	1.74	726	0.319	798	0.0402
367	0.0158	439	0.630	511	1.02	583	2.48	655	1.71	727	0.310	799	0.0393
368	0.0159	440	0.692	512	1.05	584	2.49	656	1.69	728	0.302	800	0.0380
369	0.0143	441	0.756	513	1.07	585	2.52	657	1.66	729	0.293	801	0.0368
370	0.0156	442	0.815	514	1.09	586	2.52	658	1.63	730	0.285	802	0.0358
371	0.0154	443	0.887	515	1.12	587	2.54	659	1.60	731	0.276	803	0.0351
372	0.0165	444	0.961	516	1.13	588	2.55	660	1.57	732	0.269	804	0.0340
373	0.0158	445	1.05	517	1.16	589	2.56	661	1.54	733	0.261	805	0.0335
374	0.0149	446	1.14	518	1.18	590	2.58	662	1.52	734	0.254	806	0.0324
375	0.0154	447	1.23	519	1.20	591	2.59	663	1.49	735	0.247	807	0.0313
376	0.0150	448	1.32	520	1.22	592	2.60	664	1.46	736	0.240	808	0.0305
377	0.0148	449	1.41	521	1.24	593	2.61	665	1.43	737	0.233	809	0.0296
378	0.0160	450	1.49	522	1.26	594	2.61	666	1.40	738	0.226	810	0.0288
379	0.0158	451	1.57	523	1.27	595	2.62	667	1.38	739	0.220	811	0.0281
380	0.0161	452	1.62	524	1.29	596	2.63	668	1.35	740	0.214	812	0.0272
381	0.0158	453	1.65	525	1.31	597	2.63	669	1.32	741	0.208	813	0.0263
382	0.0161	454	1.66	526	1.33	598	2.64	670	1.30	742	0.202	814	0.0259
383	0.0165	455	1.64	527	1.35	599	2.65	671	1.27	743	0.197	815	0.0255
384	0.0166	456	1.60	528	1.37	600	2.65	672	1.24	744	0.191	816	0.0244
385	0.0159	457	1.55	529	1.38	601	2.66	673	1.22	745	0.185	817	0.0237
386	0.0164	458	1.47	530	1.40	602	2.65	674	1.19	746	0.180	818	0.0234
387	0.0166	459	1.39	531	1.42	603	2.66	675	1.17	747	0.175	819	0.0224
388	0.0175	460	1.31	532	1.43	604	2.65	676	1.14	748	0.170	820	0.0220
389	0.0175	461	1.22	533	1.45	605	2.66	677	1.12	749	0.166	821	0.0213
390	0.0176	462	1.15	534	1.47	606	2.66	678	1.09	750	0.160	822	0.0208
391	0.0191	463	1.08	535	1.49	607	2.65	679	1.07	751	0.157	823	0.0203
392	0.0194	464	1.02	536	1.51	608	2.64	680	1.05	752	0.152	824	0.0199
393	0.0186	465	0.972	537	1.53	609	2.64	681	1.02	753	0.147	825	0.0196
394	0.0206	466	0.927	538	1.54	610	2.64	682	1.00	754	0.144	826	0.0188
395	0.0209	467	0.887	539	1.56	611	2.63	683	0.978	755	0.140	827	0.0177
396	0.0218	468	0.853	540	1.58	612	2.62	684	0.957	756	0.136	828	0.0177
397	0.0212	469	0.813	541	1.60	613	2.62	685	0.935	757	0.132	829	0.0172
398	0.0217	470	0.786	542	1.62	614	2.61	686	0.913	758	0.128	830	0.0168
399	0.0242	471	0.757	543	1.64	615	2.60	687	0.890	759	0.124	831	0.0164
400	0.0237	472	0.723	544	1.66	616	2.59	688	0.869	760	0.121	832	0.0159
401	0.0244	473	0.687	545	1.68	617	2.58	689	0.848	761	0.118	833	0.0154
402	0.0265	474	0.655	546	1.70	618	2.56	690	0.827	762	0.115	834	0.0153
403	0.0277	475	0.625	547	1.72	619	2.55	691	0.808	763	0.111	835	0.0147
404	0.0288	476	0.602	548	1.74	620	2.53	692	0.788	764	0.108	836	0.0141
405	0.0306	477	0.577	549	1.76	621	2.52	693	0.769	765	0.105	837	0.0140
406	0.0320	478	0.556	550	1.78	622	2.51	694	0.751	766	0.102	838	0.0138
407	0.0338	479	0.537	551	1.80	623	2.49	695	0.733	767	0.0983	839	0.0132
408	0.0365	480	0.526	552	1.82	624	2.48	696	0.714	768	0.0960	840	0.0130
409	0.0387	481	0.516	553	1.84	625	2.46	697	0.696	769	0.0930	841	0.0124
410	0.0419	482	0.512	554	1.87	626	2.44	698	0.680	770	0.0905	842	0.0127
411	0.0448	483	0.509	555	1.88	627	2.42	699	0.662	771	0.0881	843	0.0120
412	0.0488	484	0.508	556	1.91	628	2.40	700	0.647	772	0.0855	844	0.0115
413	0.0534	485	0.512	557	1.93	629	2.38	701	0.630	773	0.0828	845	0.0111
414	0.0584	486	0.516	558	1.95	630	2.36	702	0.614	774	0.0807	846	0.0110
415	0.0635	487	0.520	559	1.98	631	2.34	703	0.598	775	0.0779	847	0.0110
416	0.0679	488	0.532	560	2.00	632	2.32	704	0.582	776	0.0761	848	0.0105
417	0.0753	489	0.541	561	2.02	633	2.30	705	0.566	777	0.0731	849	0.0105
418	0.0826	490	0.551	562	2.05	634	2.28	706	0.553	778	0.0718	850	0.0104
419	0.0902	491	0.566	563	2.07	635	2.25	707	0.537	779	0.0695		
420	0.101	492	0.581	564	2.09	636	2.23	708	0.524	780	0.0676		
421	0.111	493	0.595	565	2.11	637	2.20	709	0.510	781	0.0659		



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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-XX30-15-YY  
Project Number  
10461972  
Test Number  
748181

Test Date

2014-09-18

Prepared By

A handwritten signature in black ink that reads "Javier Caban".

Javier Caban, Technician

Approved By

A handwritten signature in black ink that reads "Eric M. Gaudreau".

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-XX30-15-YY  
Lamp: Three white LEDs with optics below each  
Mounting: Surface  
Ballast/Driver: One Meanwell LPV-60-12

Luminaire

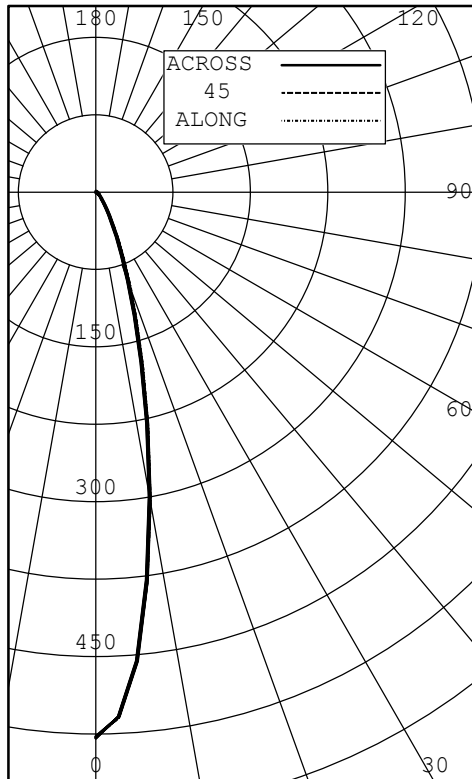


#### Test Conditions

Test Temperature:	24.6 °C
Voltage:	120.0 VAC
Current:	0.06489 A
Power:	3.193 W
Power Factor:	0.410
Frequency:	60 Hz
Current THD:	172 %



INTENSITY (CANDLEPOWER) SUMMARY OUTPUT LUMENS



ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	528	528	528	528	528	
5	456	456	457	458	456	39
10	305	304	304	304	300	
15	176	175	174	173	171	48
20	98	96	96	94	91	
25	53	51	51	50	48	24
30	28	28	28	27	26	
35	16	16	16	15	15	10
40	10	10	10	10	9	
45	7	7	7	7	6	5
50	5	5	5	5	5	
55	4	4	4	4	4	3
60	3	3	3	3	3	
65	2	2	2	2	2	2
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	111	82.98
0-40	122	90.56
0-60	130	97.03
0-90	134	100.00
40-90	13	9.44
60-90	4	2.97
90-180	0	0.00
0-180	134	100.00

EFFICACY (LUMENS PER WATT): 41.9

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

LUMINOUS DIAMETER: 0.875 INS

LUMINANCE SUMMARY CD./SQ.M.

S/MH: 0.4  
 SC: 0.4

ANGLE	ALONG	45	ACROSS
45	23877	24517	23236
55	16627	16916	17593
65	13723	14383	15000
75	11951	12464	11497
85	8872	10378	8906

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	528	528	528	528	528	528	
2.5	510	510	511	510	509	510	
5.0	456	456	457	458	456	457	39
7.5	381	382	382	383	379	382	
10.0	305	304	304	304	300	304	
12.5	234	234	233	232	230	233	
15.0	176	175	174	173	171	174	48
17.5	133	131	130	128	126	130	
20.0	98	96	96	94	91	95	
22.5	73	71	70	69	66	70	
25.0	53	51	51	50	48	51	24
27.5	39	38	38	36	35	37	
30.0	28	28	28	27	26	27	
32.5	21	21	21	20	19	20	
35.0	16	16	16	15	15	16	10
37.5	12	12	12	12	12	12	
40.0	10	10	10	10	9	10	
42.5	8	8	8	8	8	8	
45.0	7	7	7	7	6	7	5
47.5	6	6	6	6	5	6	
50.0	5	5	5	5	5	5	
52.5	4	5	4	4	4	4	
55.0	4	4	4	4	4	4	3
57.5	3	4	3	3	4	3	
60.0	3	3	3	3	3	3	
62.5	3	3	3	3	3	3	
65.0	2	2	2	2	2	2	2
67.5	2	2	2	2	2	2	
70.0	2	2	2	2	2	2	
72.5	1	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	0	0	0	1	1	0	
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	.131	.111	.09	1.141	.121	.091	.07	1.121	.101	.081	.06	1.051	.041	.021	.02	1.021	.010	.099	0.980	.970	.96	0.95		
	2	1.121	.081	.051	.01	1.101	.061	.031	.00	1.081	.041	.010	.99	1.010	.990	.97	0.990	.970	.95	0.960	.940	.93	0.91			
	3	1.081	.030	.990	.95	1.061	.020	.980	.95	1.051	.000	.970	.94	0.980	.950	.93	0.960	.930	.91	0.940	.920	.90	0.89			
	4	1.050	.990	.940	.91	1.030	.980	.940	.91	1.020	.970	.930	.90	0.950	.910	.89	0.930	.900	.88	0.910	.890	.87	0.86			
	5	1.020	.950	.900	.87	1.000	.940	.900	.86	0.990	.930	.890	.86	0.910	.880	.85	0.900	.870	.85	0.890	.860	.84	0.83			
	6	0.990	.920	.870	.84	0.970	.910	.870	.84	0.960	.900	.860	.83	0.890	.860	.83	0.880	.850	.82	0.870	.840	.82	0.81			
	7	0.950	.880	.840	.81	0.940	.880	.840	.81	0.930	.870	.830	.80	0.860	.820	.80	0.850	.820	.79	0.840	.810	.79	0.78			
	8	0.930	.860	.810	.78	0.920	.850	.810	.78	0.910	.840	.810	.78	0.840	.800	.78	0.830	.790	.77	0.820	.790	.77	0.76			
	9	0.900	.830	.790	.76	0.890	.830	.790	.76	0.890	.820	.780	.76	0.810	.780	.75	0.810	.770	.75	0.800	.770	.75	0.74			
	10	0.880	.810	.760	.73	0.870	.800	.760	.73	0.860	.800	.760	.73	0.790	.760	.73	0.790	.750	.73	0.780	.750	.73	0.72			

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	32.9	1.54
6.00	14.6	2.30
8.00	8.22	3.07
10.0	5.26	3.84
12.0	3.65	4.61
14.0	2.68	5.38
16.0	2.05	6.14

**Cone of Light Plot**

