AZIMUTH PATTERN (H-Pol): Dielectric TFU-15JSC/VP-R-CT160/TUA-C1SP-2/2U-1
Main beam axis of symmetry: 74° true
Electrical Beam Tilt: 0.75
Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak) 1.60 (2.04 dBd)
Maximum Main Beam H-Pol. Effective Radiated Power (ERP): 750.0 kW 28.75 dBk
Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 187.0 kW 22.72 dBk

Tabulation of Azimuth Pattern (Horizontal polarization)

Angle	RF	dBk	ERP kW
0	0.974	28.5	711.5
10	0.935	28.2	655.7
20	0.872	27.6	570.3
30	0.822	27.0	506.8
40	0.823	27.1	508.1
50	0.878	27.6	578.3
60	0.950	28.3	677.1
70	0.996	28.7	744.3
80	0.990	28.7	735.3
90	0.936	28.2	657.2
100	0.864	27.5	560.0
110	0.818	27.0	501.9
120	0.829	27.1	515.5
130	0.885	27.7	587.4
140	0.945	28.3	669.8
150	0.977	28.5	715.9
160	0.974	28.5	711.5
170	0.943	28.2	666.9
180	0.893	27.8	598.1
190	0.818	27.0	501.9
200	0.698	25.6	365.1
210	0.522	23.1	204.3
220	0.329	19.1	81.3
230	0.287	17.9	61.6
240	0.430	21.4	138.7
250	0.537	23.3	216.2
260	0.516	23.0	199.8
270	0.378	20.3	107.3
280	0.248	16.6	45.9
290	0.354	19.7	93.8
300	0.559	23.7	234.4
310	0.726	26.0	395.5
320	0.836	27.2	524.2
330	0.905	27.9	614.3
340	0.951	28.3	678.3
350	0.977	28.5	715.9

Maximum

Angle	RF	dBk	ERP kW
74	1.000	28.8	750.3
154	0.980	28.6	720.3
253	0.545	23.5	223.0
354	0.980	28.6	720.3

Minimum

Angle	RF	dBk	ERP kW
35	0.815	27.0	498.2
113	0.815	27.0	498.2
227	0.270	17.4	54.8
281	0.246	16.6	45.3

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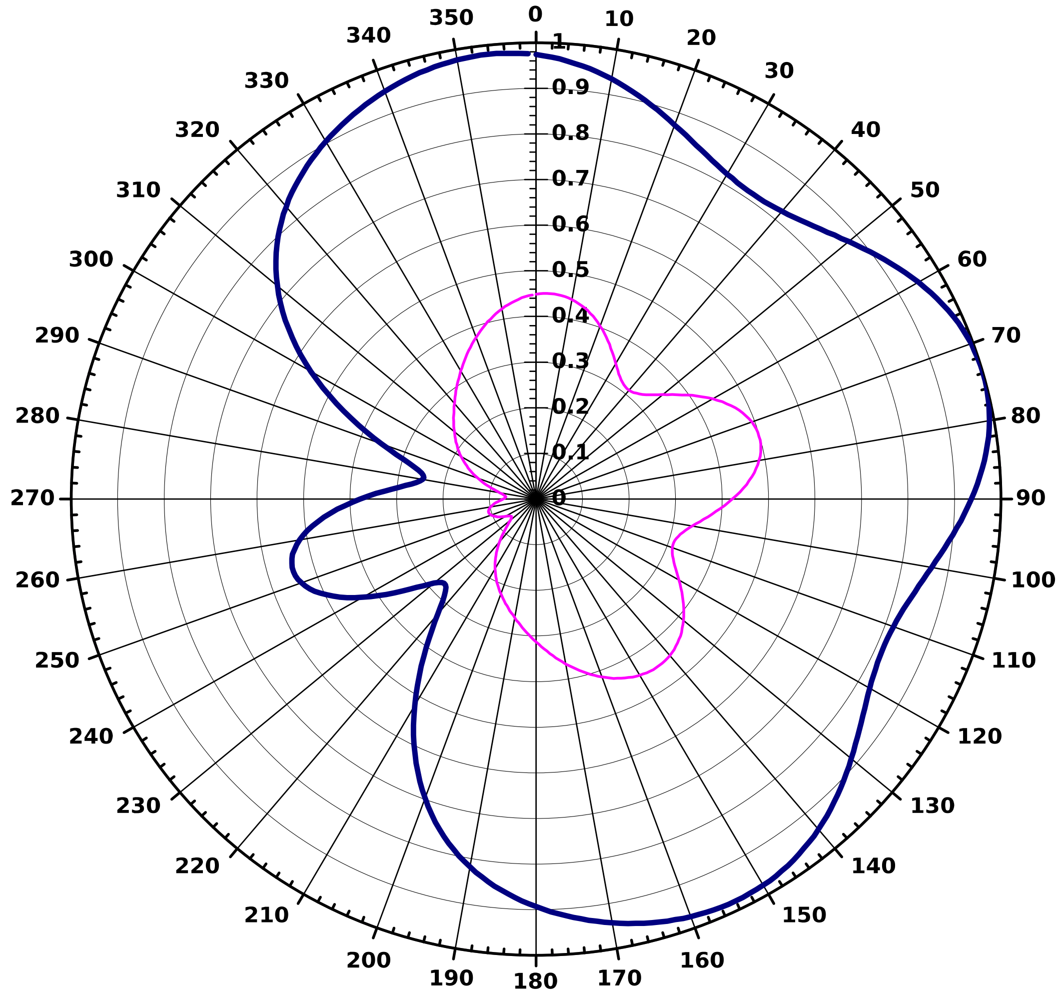
AZIMUTH PATTERN (H-Pol): Dielectric TFU-15JSC/VP-R-CT160/TUA-C1SP-2/2U-1

Main beam axis of symmetry: 74° true

Electrical Beam Tilt: 0.75

Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak)	**1.60**	**2.04 dBd**
Maximum Main Beam H-Pol. Effective Radiated Power (ERP):	**750.0 kW**	**28.75 dBk**
Maximum Main Beam V-Pol. Effective Radiated Power (ERP):	**187.0 kW**	**22.72 dBk**

AZIMUTH PATTERN RELATIVE FIELD



Blue plot shows azimuth pattern relative field for horizontal polarization

Red plot shows azimuth pattern relative field for vertical polarization

Prepared by Doug Lung

WNJU Application for Construction Permit **EXHIBIT 47**
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AZIMUTH PATTERN (H-Pol): Dielectric TFU-15JSC/VP-R-CT160/TUA-C1SP-2/2U-1
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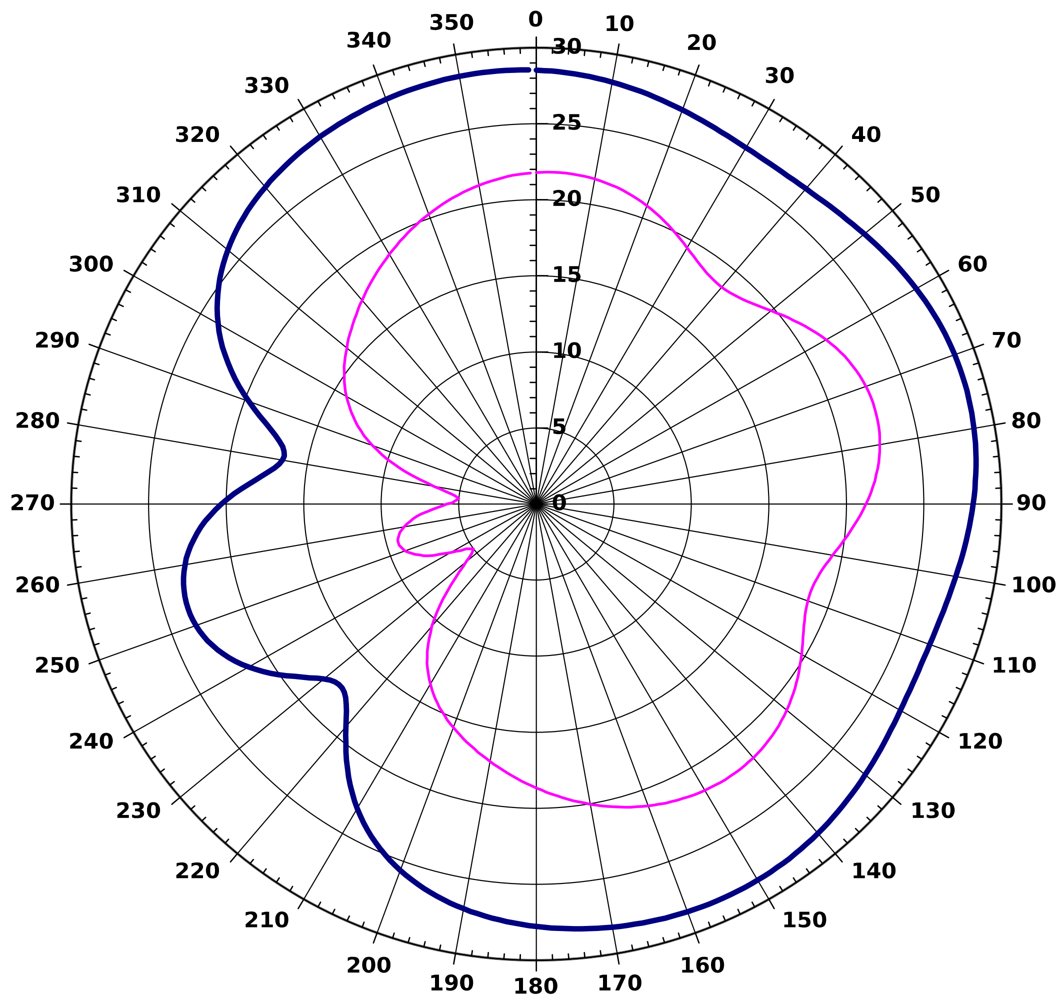
AZIMUTH PATTERN ERP (dBk)



Blue plot shows effective radiated power (dBk) for horizontal polarization
Red plot shows effective radiated power (dBk) for vertical polarization

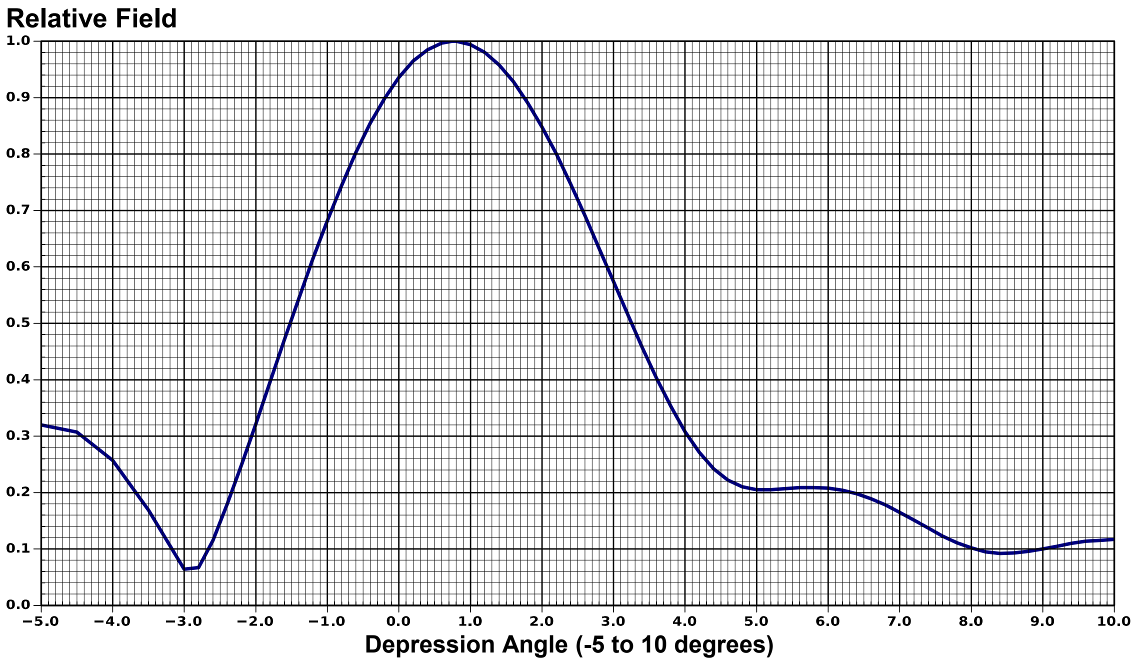
Prepared by Doug Lung

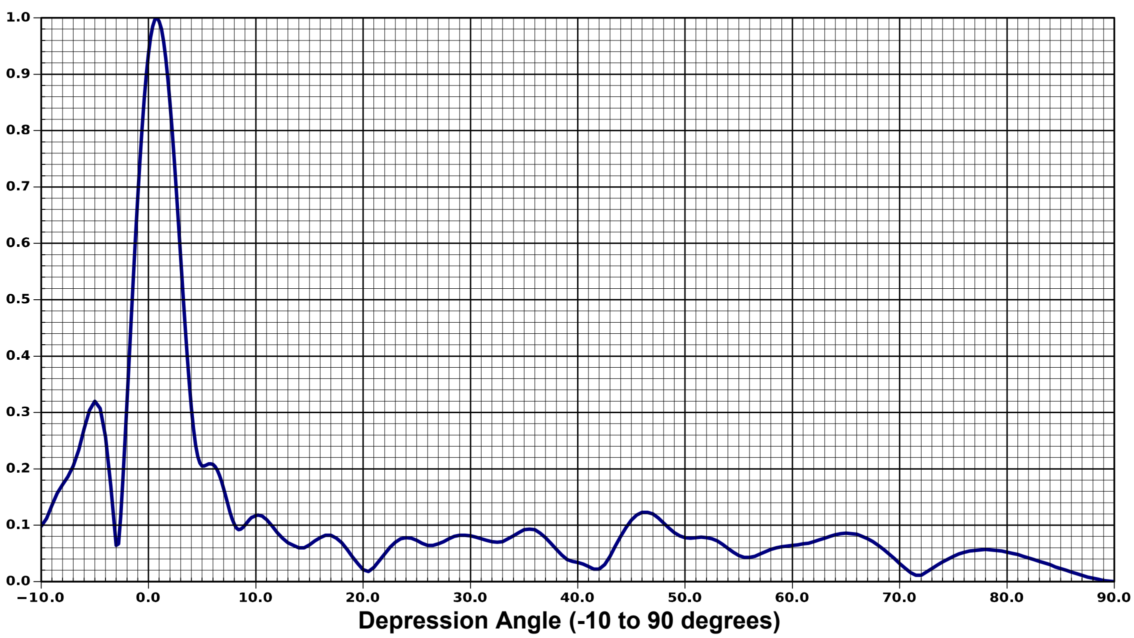
WNJU Application for Construction Permit

EXHIBIT 47
August 5, 2014

<u>ELEVATION PATTERN Dielectric TFU-15JSC/VP-R-CT160/TUA-C1SP-2/2U-1</u>

Electrical Beam Tilt: 0.75°		
Calculated Maximum Elevation Gain (H + V polarization):	**14.00**	**11.46 dBd**
RMS Gain at Horizontal (H + V polarization):	**12.30**	**10.90 dBd**
Maximum Main Beam H-Pol. Effective Radiated Power (ERP):	**750.0 kW**	**28.75 dBk**
Maximum Main Beam V-Pol. Effective Radiated Power (ERP):	**187.0 kW**	**22.72 dBk**





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WNJU Application for Construction Permit

EXHIBIT 47
August 5, 2014

<u>ELEVATION PATTERN Dielectric TFU-15JSC/VP-R-CT160/TUA-C1SP-2/2U-1</u>

Electrical Beam Tilt: 0.75°		
Calculated Maximum Elevation Gain (H + V polarization):	**14.00**	**11.46 dBd**
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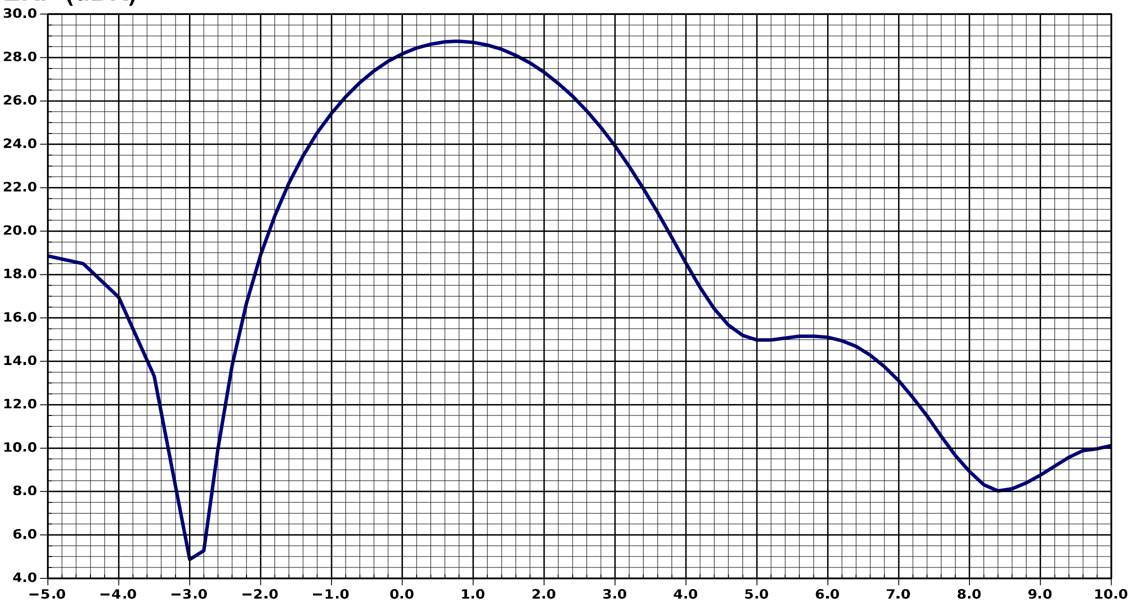
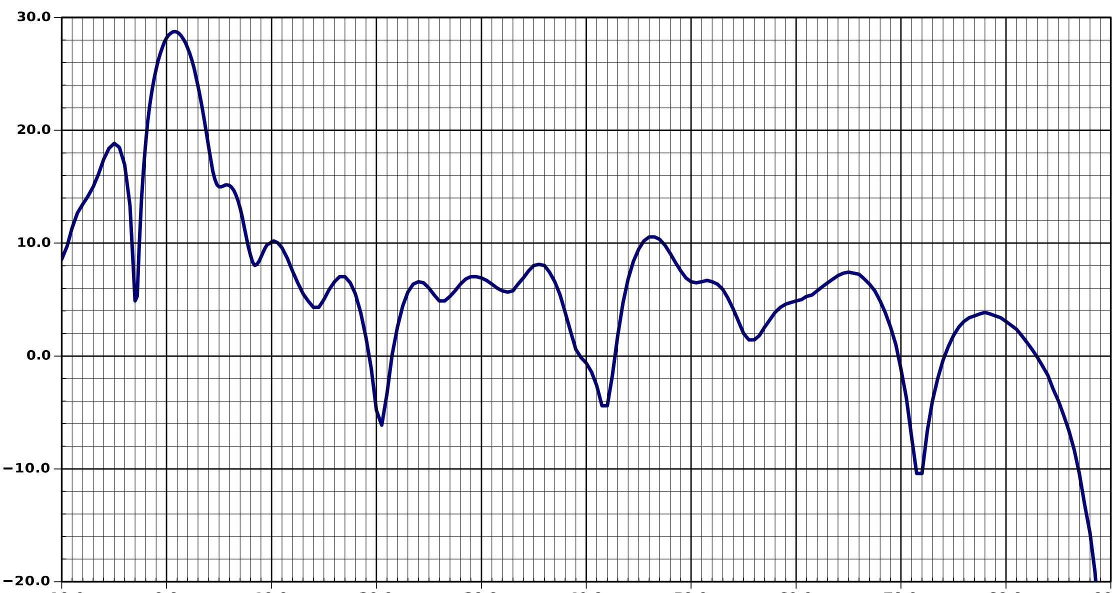
ERP (dBK)



Depression Angle (-5 to 10 degrees)



Depression Angle (-10 to 90 degrees)

Prepared by Doug Lung

ELEVATION PATTERN Dielectric TFU-15JSC/VP-R-CT160/TUA-C1SP-2/2U-1

Electrical Beam Tilt: 0.75°

Calculated Maximum Elevation Gain (H + V polarization): 14.00 11.46 dBd

RMS Gain at Horizontal (H + V polarization): 12.30 10.90 dBd

Maximum Main Beam H-Pol. Effective Radiated Power (ERP): 750.0 kW 28.75 dBk

Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 187.0 kW 22.72 dBk

Tabulation of Elevation Pattern (main lobe)

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.00	0.098	3.80	0.353	17.50	0.077	42.00	0.022	66.50	0.080
-9.50	0.112	4.00	0.308	18.00	0.069	42.50	0.030	67.00	0.076
-9.00	0.135	4.20	0.271	18.50	0.057	43.00	0.045	67.50	0.071
-8.50	0.157	4.40	0.242	19.00	0.044	43.50	0.063	68.00	0.064
-8.00	0.172	4.60	0.222	19.50	0.032	44.00	0.080	68.50	0.057
-7.50	0.186	4.80	0.210	20.00	0.021	44.50	0.096	69.00	0.049
-7.00	0.205	5.00	0.205	20.50	0.018	45.00	0.109	69.50	0.041
-6.50	0.234	5.20	0.205	21.00	0.025	45.50	0.118	70.00	0.032
-6.00	0.271	5.40	0.207	21.50	0.037	46.00	0.123	70.50	0.024
-5.50	0.304	5.60	0.209	22.00	0.049	46.50	0.123	71.00	0.016
-5.00	0.320	5.80	0.209	22.50	0.061	47.00	0.120	71.50	0.011
-4.50	0.307	6.00	0.208	23.00	0.070	47.50	0.113	72.00	0.011
-4.00	0.257	6.20	0.204	23.50	0.076	48.00	0.104	72.50	0.017
-3.50	0.169	6.40	0.198	24.00	0.078	48.50	0.095	73.00	0.023
-3.00	0.064	6.60	0.189	24.50	0.077	49.00	0.087	73.50	0.029
-2.80	0.067	6.80	0.178	25.00	0.073	49.50	0.081	74.00	0.035
-2.60	0.115	7.00	0.165	25.50	0.068	50.00	0.078	74.50	0.040
-2.40	0.179	7.20	0.151	26.00	0.064	50.50	0.077	75.00	0.045
-2.20	0.249	7.40	0.137	26.50	0.064	51.00	0.078	75.50	0.049
-2.00	0.322	7.60	0.123	27.00	0.067	51.50	0.079	76.00	0.052
-1.80	0.396	7.80	0.111	27.50	0.071	52.00	0.078	76.50	0.054
-1.60	0.471	8.00	0.102	28.00	0.076	52.50	0.076	77.00	0.055
-1.40	0.544	8.20	0.095	28.50	0.080	53.00	0.072	77.50	0.056
-1.20	0.615	8.40	0.092	29.00	0.082	53.50	0.066	78.00	0.057
-1.00	0.682	8.60	0.093	29.50	0.082	54.00	0.059	78.50	0.056
-0.80	0.745	8.80	0.096	30.00	0.081	54.50	0.052	79.00	0.055
-0.60	0.803	9.00	0.100	30.50	0.079	55.00	0.046	79.50	0.054
-0.40	0.855	9.20	0.105	31.00	0.076	55.50	0.043	80.00	0.052
-0.20	0.899	9.40	0.110	31.50	0.073	56.00	0.043	80.50	0.050
0.00	0.936	9.60	0.114	32.00	0.071	56.50	0.045	81.00	0.048
0.20	0.965	9.80	0.115	32.50	0.070	57.00	0.049	81.50	0.045
0.40	0.985	10.00	0.117	33.00	0.071	57.50	0.053	82.00	0.042
0.60	0.997	10.20	0.118	33.50	0.076	58.00	0.057	82.50	0.039
0.75	1.000	10.40	0.117	34.00	0.081	58.50	0.060	83.00	0.036
0.80	1.000	10.60	0.116	34.50	0.087	59.00	0.062	83.50	0.033
1.00	0.994	10.80	0.113	35.00	0.092	59.50	0.063	84.00	0.030
1.20	0.980	11.00	0.110	35.50	0.093	60.00	0.064	84.50	0.026
1.40	0.958	11.50	0.099	36.00	0.092	60.50	0.065	85.00	0.023
1.60	0.928	12.00	0.087	36.50	0.086	61.00	0.067	85.50	0.020
1.80	0.891	12.50	0.077	37.00	0.078	61.50	0.068	86.00	0.017
2.00	0.848	13.00	0.069	37.50	0.068	62.00	0.071	86.50	0.014
2.20	0.800	13.50	0.064	38.00	0.057	62.50	0.074	87.00	0.011
2.40	0.747	14.00	0.060	38.50	0.047	63.00	0.077	87.50	0.008
2.60	0.691	14.50	0.060	39.00	0.039	63.50	0.080	88.00	0.006
2.80	0.633	15.00	0.065	39.50	0.036	64.00	0.083	88.50	0.004
3.00	0.574	15.50	0.072	40.00	0.034	64.50	0.085	89.00	0.002
3.20	0.515	16.00	0.078	40.50	0.031	65.00	0.086	89.50	0.001
3.40	0.458	16.50	0.082	41.00	0.027	65.50	0.085	90.00	0.000