

TECHNICAL SUMMARY  
STA REQUEST  
LOW POWER DIGITAL STATION WTNC-LD  
DURHAM, NORTH CAROLINA  
CHANNEL 19 6.56 KW (ND)

1. The instant application is for an STA to operate WTNC-LD on in core, pre-transition channel 19 at Durham, North Carolina with a directional antenna maximum effective radiated power (ERP) of 6.56 kW using an ERI model ALP12O-19-PLE elliptically polarized nondirectional antenna.<sup>1</sup> The antenna radiation center height will be 245.1 m AMSL. There will be no change in the overall structure height of the existing structure (ASRN 1002990).

2. Eligibility/Pre-Transition Channel Availability: WTNC-LD received a 120 day letter from T-Mobile indicating that the current WTNC-LD operation on channel 40 would likely interfere with its new 600 MHz band license. Therefore, pursuant to the FCC's Public Notice dated June 14, 2017 entitled "*Incentive Auction Task Force and Media Bureau Set Forth Tools Available to LPTV/Translator Stations Displaced Prior to the Special Displacement Window*" (DA 17-584, MB Docket No. 16-306, GN Docket No. 12-268), WTNC-LD is eligible to submit this STA to operate on channel 19 which is currently an available pre-transition channel. It is noted that WTNC-LD is authorized to operate on post-transition displacement channel 11 (LMS File No. 0000045780). The WTNC-LD channel 11 displacement application contained a request for waiver of the contingent application rule (Section 73.3517) as channel 11 is a currently precluded from use by WTVD on co-channel 11 at Durham, North Carolina (FCC File No. BMLCDT-20120814AAG). Thus, the instant STA operation will permit WTNC-LD to continue on-air operation until WTVD vacates channel 11 in Phase No. 9, at which time WTNC-LD will commence its authorized post-transition operation on channel 11.

3. Interference Compliance: As indicated in the attached *TVStudy* analysis, WTNC-LD's proposed channel 19 STA operation meets the FCC's interference protection requirements with respect to all protected facilities based on a both a pre- and post-transition

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<sup>1</sup> The proposed channel 19 facilities will also work post-transition as noted in paragraph 3.

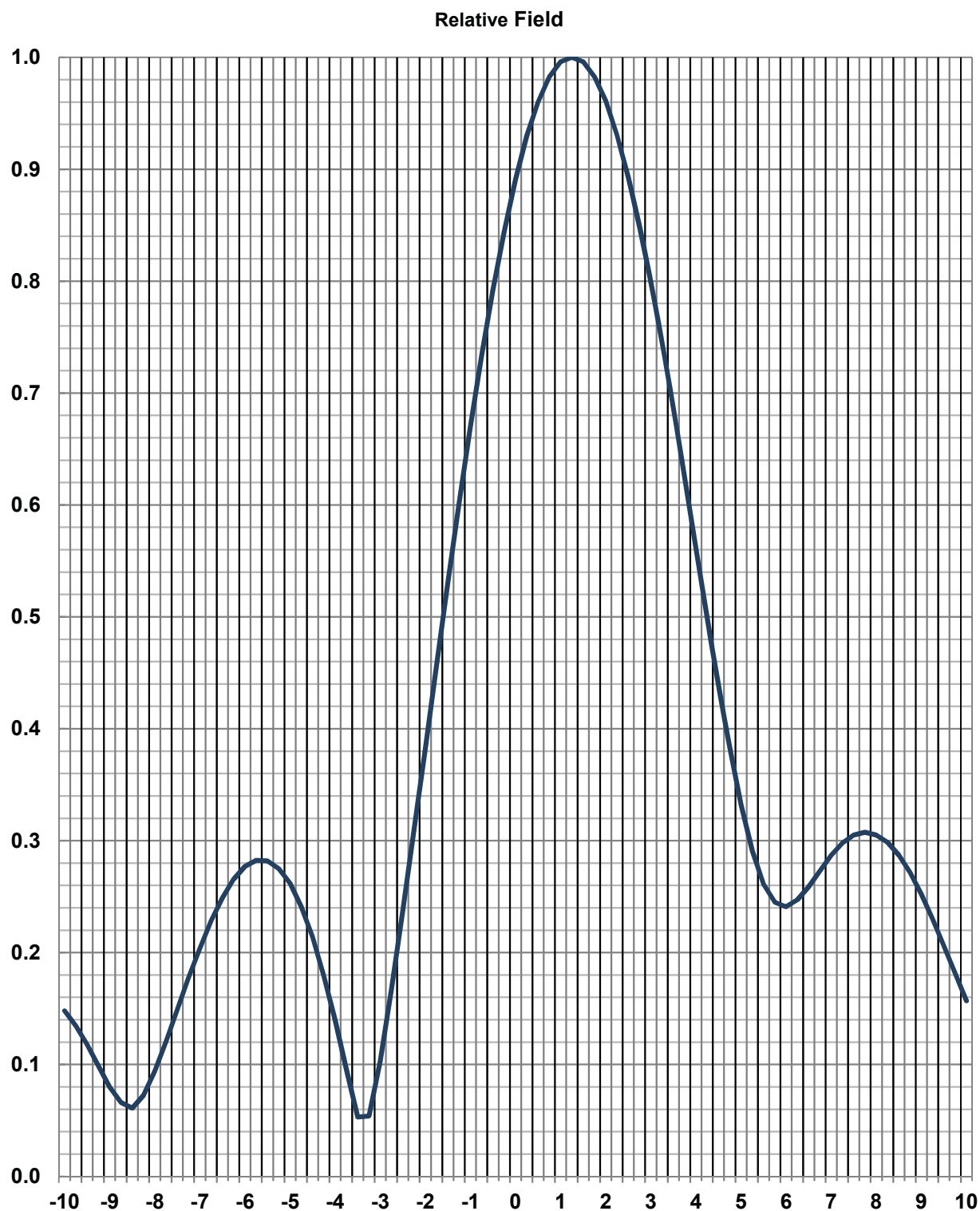
allocation environment. A cell size of 1.0 km and a profile resolution of 0.2 km points/km were utilized for the TVStudy analysis.

4. RFR Compliance: The proposed facilities were evaluated in terms of potential radiofrequency radiation (RFR) exposure at ground level to workers and the general public. The radiation center for the proposed DTV antenna will be located 108 meters above ground level. The total DTV ERP is 8.2 (6.56 kW horizontal polarization, 1.64 kW vertical polarization). A greater than expected vertical plane relative field value of 0.1 is presumed for the antenna's downward radiation (-60° to -90° elevation, see vertical plane relative field pattern attached). The calculated power density at a point 2 meters above ground level is  $0.24 \text{ uW/cm}^2$  which is 0.07 % of the FCC's recommended limit of  $335.3 \text{ uW/cm}^2$  for channel 19 for an uncontrolled environment.

Access to the transmitting site will be restricted and appropriately marked with RFR warning signs. Furthermore, as this is a multi-user site, a formal RFR protection protocol is in effect in the event that workers or other authorized personnel enter the restricted area or climb the tower to ensure that appropriate measure will be taken to assure worker safety with respect to RFR exposure. Such measures include limiting the exposure time, wearing protective clothing, reducing power to an acceptable level or termination of transmitter output power all together until workers leave the restricted area.

## Elevation Pattern

Type:	AL12PL5	Polarization:	Horizontal
Directivity:		Frequency:	19 (ATSC)
Main Lobe:	12.00 numeric (10.79 dB)	Location:	Durham, NC
Horizontal:	9.53 numeric (9.79 dB)	Beam Tilt:	1.25 degrees



**Tabulated Data for Elevation Pattern****Type:**

AL12PL5

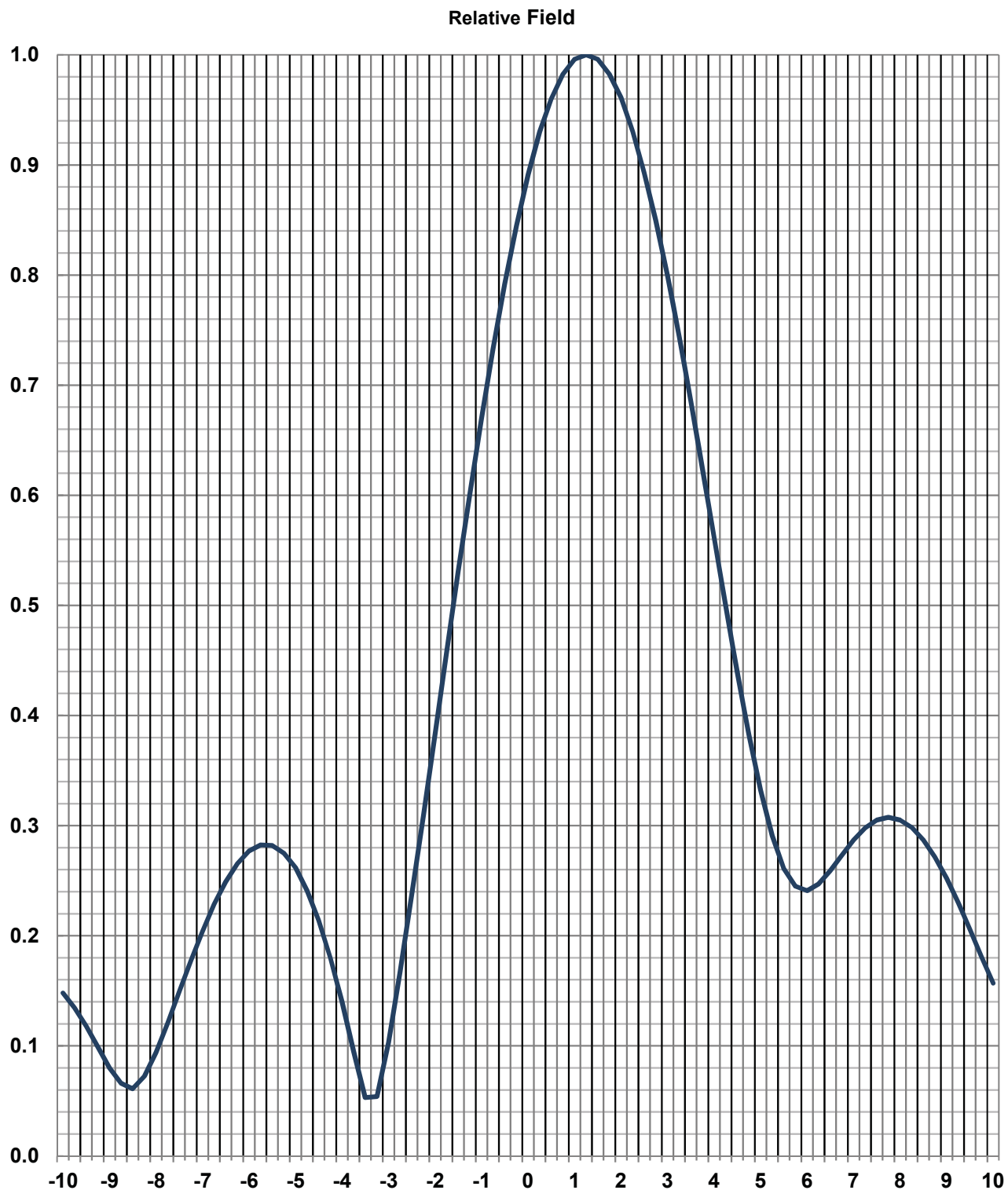
-10 to 10 degrees in 0.25 degree increments.

10 to 90 degrees in 0.50 degree increments.

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-10.00	0.148	-16.59	2.25	0.931	-0.63	19.00	0.119	-18.49	43.50	0.043	-27.33	68.00	0.090	-20.92
-9.75	0.135	-17.43	2.50	0.893	-0.98	19.50	0.104	-19.66	44.00	0.031	-30.17	68.50	0.086	-21.31
-9.50	0.118	-18.56	2.75	0.850	-1.42	20.00	0.083	-21.62	44.50	0.025	-32.04	69.00	0.082	-21.72
-9.25	0.099	-20.09	3.00	0.799	-1.95	20.50	0.061	-24.29	45.00	0.028	-31.06	69.50	0.077	-22.27
-9.00	0.080	-21.94	3.25	0.745	-2.56	21.00	0.048	-26.38	45.50	0.038	-28.40	70.00	0.071	-22.97
-8.75	0.066	-23.61	3.50	0.686	-3.27	21.50	0.052	-25.68	46.00	0.050	-26.02	70.50	0.065	-23.74
-8.50	0.061	-24.29	3.75	0.625	-4.09	22.00	0.069	-23.22	46.50	0.060	-24.44	71.00	0.058	-24.73
-8.25	0.073	-22.79	4.00	0.562	-5.01	22.50	0.086	-21.31	47.00	0.069	-23.22	71.50	0.050	-26.02
-8.00	0.094	-20.54	4.25	0.500	-6.03	23.00	0.098	-20.18	47.50	0.074	-22.62	72.00	0.043	-27.33
-7.75	0.121	-18.38	4.50	0.439	-7.15	23.50	0.104	-19.66	48.00	0.077	-22.27	72.50	0.036	-28.87
-7.50	0.149	-16.54	4.75	0.383	-8.34	24.00	0.102	-19.83	48.50	0.076	-22.38	73.00	0.029	-30.75
-7.25	0.178	-15.02	5.00	0.332	-9.58	24.50	0.093	-20.63	49.00	0.072	-22.85	73.50	0.022	-33.15
-7.00	0.204	-13.81	5.25	0.291	-10.72	25.00	0.079	-22.05	49.50	0.066	-23.61	74.00	0.016	-35.92
-6.75	0.229	-12.82	5.50	0.261	-11.67	25.50	0.062	-24.15	50.00	0.057	-24.88	74.50	0.011	-39.17
-6.50	0.249	-12.08	5.75	0.245	-12.22	26.00	0.045	-26.94	50.50	0.046	-26.74	75.00	0.010	-40.00
-6.25	0.266	-11.52	6.00	0.241	-12.36	26.50	0.038	-28.40	51.00	0.035	-29.12	75.50	0.013	-37.72
-6.00	0.277	-11.15	6.25	0.247	-12.15	27.00	0.045	-26.94	51.50	0.025	-32.04	76.00	0.017	-35.39
-5.75	0.283	-10.98	6.50	0.259	-11.73	27.50	0.060	-24.44	52.00	0.021	-33.56	76.50	0.021	-33.56
-5.50	0.282	-11.00	6.75	0.273	-11.28	28.00	0.074	-22.62	52.50	0.026	-31.70	77.00	0.026	-31.70
-5.25	0.275	-11.21	7.00	0.287	-10.84	28.50	0.084	-21.51	53.00	0.037	-28.64	77.50	0.030	-30.46
-5.00	0.262	-11.63	7.25	0.298	-10.52	29.00	0.089	-21.01	53.50	0.048	-26.38	78.00	0.033	-29.63
-4.75	0.241	-12.36	7.50	0.305	-10.31	29.50	0.088	-21.11	54.00	0.058	-24.73	78.50	0.037	-28.64
-4.50	0.214	-13.39	7.75	0.308	-10.24	30.00	0.081	-21.83	54.50	0.067	-23.48	79.00	0.039	-28.18
-4.25	0.180	-14.92	8.00	0.305	-10.31	30.50	0.069	-23.22	55.00	0.074	-22.62	79.50	0.041	-27.74
-4.00	0.140	-17.08	8.25	0.299	-10.50	31.00	0.055	-25.19	55.50	0.079	-22.05	80.00	0.043	-27.33
-3.75	0.095	-20.45	8.50	0.287	-10.84	31.50	0.040	-27.96	56.00	0.081	-21.83	80.50	0.044	-27.13
-3.50	0.053	-25.51	8.75	0.272	-11.32	32.00	0.032	-29.90	56.50	0.081	-21.83	81.00	0.044	-27.13
-3.25	0.054	-25.35	9.00	0.252	-11.97	32.50	0.036	-28.87	57.00	0.078	-22.16	81.50	0.044	-27.13
-3.00	0.103	-19.74	9.25	0.230	-12.77	33.00	0.049	-26.20	57.50	0.073	-22.73	82.00	0.044	-27.13
-2.75	0.168	-15.52	9.50	0.206	-13.72	33.50	0.062	-24.15	58.00	0.066	-23.61	82.50	0.043	-27.33
-2.50	0.237	-12.51	9.75	0.181	-14.85	34.00	0.073	-22.73	58.50	0.058	-24.73	83.00	0.042	-27.54
-2.25	0.310	-10.19	10.00	0.157	-16.08	34.50	0.079	-22.05	59.00	0.048	-26.38	83.50	0.041	-27.74
-2.00	0.383	-8.34	10.50	0.117	-18.64	35.00	0.081	-21.83	59.50	0.037	-28.64	84.00	0.039	-28.18
-1.75	0.458	-6.79	11.00	0.104	-19.66	35.50	0.078	-22.16	60.00	0.026	-31.70	84.50	0.037	-28.64
-1.50	0.531	-5.50	11.50	0.121	-18.34	36.00	0.071	-22.97	60.50	0.017	-35.39	85.00	0.034	-29.37
-1.25	0.602	-4.41	12.00	0.147	-16.65	36.50	0.060	-24.44	61.00	0.014	-37.08	85.50	0.032	-29.90
-1.00	0.670	-3.48	12.50	0.167	-15.55	37.00	0.047	-26.56	61.50	0.021	-33.56	86.00	0.029	-30.75
-0.75	0.734	-2.69	13.00	0.177	-15.04	37.50	0.035	-29.12	62.00	0.031	-30.17	86.50	0.025	-32.04
-0.50	0.792	-2.03	13.50	0.173	-15.24	38.00	0.028	-31.06	62.50	0.042	-27.54	87.00	0.022	-33.15
-0.25	0.845	-1.46	14.00	0.158	-16.03	38.50	0.032	-29.90	63.00	0.053	-25.51	87.50	0.019	-34.42
0.00	0.891	-1.00	14.50	0.132	-17.59	39.00	0.043	-27.33	63.50	0.062	-24.15	88.00	0.015	-36.48
0.25	0.930	-0.63	15.00	0.102	-19.83	39.50	0.055	-25.19	64.00	0.071	-22.97	88.50	0.011	-39.17
0.50	0.960	-0.35	15.50	0.075	-22.50	40.00	0.066	-23.61	64.50	0.078	-22.16	89.00	0.008	-41.94
0.75	0.983	-0.15	16.00	0.064	-23.88	40.50	0.073	-22.73	65.00	0.084	-21.51	89.50	0.004	-47.96
1.00	0.996	-0.03	16.50	0.076	-22.38	41.00	0.077	-22.27	65.50	0.088	-21.11	90.00	0.000	---
1.25	1.000	0.00	17.00	0.097	-20.26	41.50	0.077	-22.27	66.00	0.091	-20.82			
1.50	0.996	-0.03	17.50	0.115	-18.79	42.00	0.073	-22.73	66.50	0.093	-20.63			
1.75	0.983	-0.15	18.00	0.126	-17.99	42.50	0.065	-23.74	67.00	0.093	-20.63			
2.00	0.961	-0.35	18.50	0.127	-17.92	43.00	0.055	-25.19	67.50	0.092	-20.72			

## Elevation Pattern

Type:	AL12PL5		Polarization:	Vertical
Directivity:			Frequency:	19 (ATSC)
Main Lobe:	12.00 numeric	(10.79 dB)	Location:	Durham, NC
Horizontal:	9.53 numeric	(9.79 dB)	Beam Tilt:	1.25 degrees



**Tabulated Data for Elevation Pattern**

Type:

AL12PL5

-10 to 10 degrees in 0.25 degree increments.

10 to 90 degrees in 0.50 degree increments.

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-10.00	0.148	-16.59	2.25	0.931	-0.63	19.00	0.119	-18.49	43.50	0.043	-27.33	68.00	0.090	-20.92
-9.75	0.135	-17.43	2.50	0.893	-0.98	19.50	0.104	-19.66	44.00	0.031	-30.17	68.50	0.086	-21.31
-9.50	0.118	-18.56	2.75	0.850	-1.42	20.00	0.083	-21.62	44.50	0.025	-32.04	69.00	0.082	-21.72
-9.25	0.099	-20.09	3.00	0.799	-1.95	20.50	0.061	-24.29	45.00	0.028	-31.06	69.50	0.077	-22.27
-9.00	0.080	-21.94	3.25	0.745	-2.56	21.00	0.048	-26.38	45.50	0.038	-28.40	70.00	0.071	-22.97
-8.75	0.066	-23.61	3.50	0.686	-3.27	21.50	0.052	-25.68	46.00	0.050	-26.02	70.50	0.065	-23.74
-8.50	0.061	-24.29	3.75	0.625	-4.09	22.00	0.069	-23.22	46.50	0.060	-24.44	71.00	0.058	-24.73
-8.25	0.073	-22.79	4.00	0.562	-5.01	22.50	0.086	-21.31	47.00	0.069	-23.22	71.50	0.050	-26.02
-8.00	0.094	-20.54	4.25	0.500	-6.03	23.00	0.098	-20.18	47.50	0.074	-22.62	72.00	0.043	-27.33
-7.75	0.121	-18.38	4.50	0.439	-7.15	23.50	0.104	-19.66	48.00	0.077	-22.27	72.50	0.036	-28.87
-7.50	0.149	-16.54	4.75	0.383	-8.34	24.00	0.102	-19.83	48.50	0.076	-22.38	73.00	0.029	-30.75
-7.25	0.178	-15.02	5.00	0.332	-9.58	24.50	0.093	-20.63	49.00	0.072	-22.85	73.50	0.022	-33.15
-7.00	0.204	-13.81	5.25	0.291	-10.72	25.00	0.079	-22.05	49.50	0.066	-23.61	74.00	0.016	-35.92
-6.75	0.229	-12.82	5.50	0.261	-11.67	25.50	0.062	-24.15	50.00	0.057	-24.88	74.50	0.011	-39.17
-6.50	0.249	-12.08	5.75	0.245	-12.22	26.00	0.045	-26.94	50.50	0.046	-26.74	75.00	0.010	-40.00
-6.25	0.266	-11.52	6.00	0.241	-12.36	26.50	0.038	-28.40	51.00	0.035	-29.12	75.50	0.013	-37.72
-6.00	0.277	-11.15	6.25	0.247	-12.15	27.00	0.045	-26.94	51.50	0.025	-32.04	76.00	0.017	-35.39
-5.75	0.283	-10.98	6.50	0.259	-11.73	27.50	0.060	-24.44	52.00	0.021	-33.56	76.50	0.021	-33.56
-5.50	0.282	-11.00	6.75	0.273	-11.28	28.00	0.074	-22.62	52.50	0.026	-31.70	77.00	0.026	-31.70
-5.25	0.275	-11.21	7.00	0.287	-10.84	28.50	0.084	-21.51	53.00	0.037	-28.64	77.50	0.030	-30.46
-5.00	0.262	-11.63	7.25	0.298	-10.52	29.00	0.089	-21.01	53.50	0.048	-26.38	78.00	0.033	-29.63
-4.75	0.241	-12.36	7.50	0.305	-10.31	29.50	0.088	-21.11	54.00	0.058	-24.73	78.50	0.037	-28.64
-4.50	0.214	-13.39	7.75	0.308	-10.24	30.00	0.081	-21.83	54.50	0.067	-23.48	79.00	0.039	-28.18
-4.25	0.180	-14.92	8.00	0.305	-10.31	30.50	0.069	-23.22	55.00	0.074	-22.62	79.50	0.041	-27.74
-4.00	0.140	-17.08	8.25	0.299	-10.50	31.00	0.055	-25.19	55.50	0.079	-22.05	80.00	0.043	-27.33
-3.75	0.095	-20.45	8.50	0.287	-10.84	31.50	0.040	-27.96	56.00	0.081	-21.83	80.50	0.044	-27.13
-3.50	0.053	-25.51	8.75	0.272	-11.32	32.00	0.032	-29.90	56.50	0.081	-21.83	81.00	0.044	-27.13
-3.25	0.054	-25.35	9.00	0.252	-11.97	32.50	0.036	-28.87	57.00	0.078	-22.16	81.50	0.044	-27.13
-3.00	0.103	-19.74	9.25	0.230	-12.77	33.00	0.049	-26.20	57.50	0.073	-22.73	82.00	0.044	-27.13
-2.75	0.168	-15.52	9.50	0.206	-13.72	33.50	0.062	-24.15	58.00	0.066	-23.61	82.50	0.043	-27.33
-2.50	0.237	-12.51	9.75	0.181	-14.85	34.00	0.073	-22.73	58.50	0.058	-24.73	83.00	0.042	-27.54
-2.25	0.310	-10.19	10.00	0.157	-16.08	34.50	0.079	-22.05	59.00	0.048	-26.38	83.50	0.041	-27.74
-2.00	0.383	-8.34	10.50	0.117	-18.64	35.00	0.081	-21.83	59.50	0.037	-28.64	84.00	0.039	-28.18
-1.75	0.458	-6.79	11.00	0.104	-19.66	35.50	0.078	-22.16	60.00	0.026	-31.70	84.50	0.037	-28.64
-1.50	0.531	-5.50	11.50	0.121	-18.34	36.00	0.071	-22.97	60.50	0.017	-35.39	85.00	0.034	-29.37
-1.25	0.602	-4.41	12.00	0.147	-16.65	36.50	0.060	-24.44	61.00	0.014	-37.08	85.50	0.032	-29.90
-1.00	0.670	-3.48	12.50	0.167	-15.55	37.00	0.047	-26.56	61.50	0.021	-33.56	86.00	0.029	-30.75
-0.75	0.734	-2.69	13.00	0.177	-15.04	37.50	0.035	-29.12	62.00	0.031	-30.17	86.50	0.025	-32.04
-0.50	0.792	-2.03	13.50	0.173	-15.24	38.00	0.028	-31.06	62.50	0.042	-27.54	87.00	0.022	-33.15
-0.25	0.845	-1.46	14.00	0.158	-16.03	38.50	0.032	-29.90	63.00	0.053	-25.51	87.50	0.019	-34.42
0.00	0.891	-1.00	14.50	0.132	-17.59	39.00	0.043	-27.33	63.50	0.062	-24.15	88.00	0.015	-36.48
0.25	0.930	-0.63	15.00	0.102	-19.83	39.50	0.055	-25.19	64.00	0.071	-22.97	88.50	0.011	-39.17
0.50	0.960	-0.35	15.50	0.075	-22.50	40.00	0.066	-23.61	64.50	0.078	-22.16	89.00	0.008	-41.94
0.75	0.983	-0.15	16.00	0.064	-23.88	40.50	0.073	-22.73	65.00	0.084	-21.51	89.50	0.004	-47.96
1.00	0.996	-0.03	16.50	0.076	-22.38	41.00	0.077	-22.27	65.50	0.088	-21.11	90.00	0.000	---
1.25	1.000	0.00	17.00	0.097	-20.26	41.50	0.077	-22.27	66.00	0.091	-20.82			
1.50	0.996	-0.03	17.50	0.115	-18.79	42.00	0.073	-22.73	66.50	0.093	-20.63			
1.75	0.983	-0.15	18.00	0.126	-17.99	42.50	0.065	-23.74	67.00	0.093	-20.63			
2.00	0.961	-0.35	18.50	0.127	-17.92	43.00	0.055	-25.19	67.50	0.092	-20.72			