

## **KHRR Application for Post-Repack Construction Permit**

**July 4, 2017**

### Engineering Exhibit

The purpose of this application is to request authority to construct a post-repack broadcast facility for operation on channel 16 for KHRR, Tucson, AZ, Facility ID 30601, licensed to NBC Telemundo License LLC.

This application specifies a top mount antenna location at a radiation center height of 1387.3m AMSL on an existing tower. The TVStudy computed HAAT is 622.0m compared with the current database HAAT of 621m and radiation center of 1383.2m. A TVStudy 2.2.2 analysis at 235 kW ERP and 1387.3m RC-AMSL showed the contour of the proposed facility will not exceed the authorized post-repack contour by more than 1% in any direction and will not cause new interference above 0.5% to any other station.

### Antenna System

The proposed facility will use a directional antenna with elliptical polarization. The proposed vertically polarized ERP is 58.75 kW. The vertically polarized ERP will not exceed the horizontally polarized ERP (235 kW) in any direction. Plots and tabulation of antenna data required by FCC Rules Section 73.625(c) are attached.

### Environmental Statement

The requested facility will be installed on top an existing tower, located in an antenna farm. The proposed top mount antenna replaces an existing antenna and will not increase the height of the tower above 199 feet.

RF power density from the facility using combined horizontal and vertically polarized ERP was calculated using the procedures described in FCC Office of Engineering and Technology Bulletin 65. The maximum power density at the site, allowing for 4m building height and 2m person height, is calculated to be 0.01895 mW/cm<sup>2</sup> or 5.86% of the FCC maximum permissible exposure level of 0.323 mW/cm<sup>2</sup> at 485 MHz for an uncontrolled environment. The area where this power density is present is not accessible to the public and is protected by a fence and locked gate with required signage. At full power, RF power density on towers closer than 78m to this facility is calculated to exceed occupational exposure levels. KHRR will coordinate with other users at the site and reduce power or shut off as required to protect workers on this and nearby towers from RF exposure above the limits specified in FCC rule §1.1310.

### Broadcast Facility

The facility proposed in this application provides similar coverage to the current authorized facility and matches, within the tolerances allowed, the post-repack facility assigned by the FCC.

Doug Lung  
July 4, 2017

**KHRR Application for Post-Repack Construction Permit****73.625(c)  
July 3, 2017****AZIMUTH PATTERN (H-Pol): Dielectric TFU-14ETT/VP-R 4C230****Main beam axis of symmetry: 75° true****Electrical Beam Tilt: 0.75****Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak) 2.24 (3.49 dBd)****Main Beam Calculated Max. V-pol Azimuth Pattern Gain (peak) 2.44 (3.88 dBd)****Maximum Main Beam H-Pol. Effective Radiated Power (ERP): 235.0 kW 23.71 dBk****Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 58.75 kW 17.69 dBk****Tabulation of Azimuth Pattern (Horizontal polarization)**

Angle	RF	dBk	ERP kW
0	0.690	20.49	111.9
10	0.790	21.66	146.7
20	0.880	22.60	182.0
30	0.940	23.17	207.6
40	0.980	23.54	225.7
50	1.000	23.71	235.0
60	1.000	23.71	235.0
70	0.990	23.62	230.3
80	0.990	23.62	230.3
90	0.990	23.62	230.3
100	0.990	23.62	230.3
110	0.980	23.54	225.7
120	0.950	23.27	212.1
130	0.890	22.70	186.1
140	0.810	21.88	154.2
150	0.700	20.61	115.2
160	0.590	19.13	81.8
170	0.500	17.69	58.8
180	0.440	16.58	45.5
190	0.390	15.53	35.7
200	0.350	14.59	28.8
210	0.290	12.96	19.8
220	0.230	10.95	12.4
230	0.200	9.73	9.4
240	0.210	10.16	10.4
250	0.220	10.56	11.4
260	0.210	10.16	10.4
270	0.190	9.29	8.5
280	0.170	8.32	6.8
290	0.210	10.16	10.4
300	0.280	12.65	18.4
310	0.350	14.59	28.8
320	0.400	15.75	37.6
330	0.450	16.77	47.6
340	0.500	17.69	58.8
350	0.590	19.13	81.8

**Maximum**

Angle	RF	dBk	ERP kW
58	1.000	23.71	235.0
251	0.220	10.56	11.4

**Minimum**

Angle	RF	dBk	ERP kW
233	0.200	9.73	9.4
279	0.170	8.32	6.8

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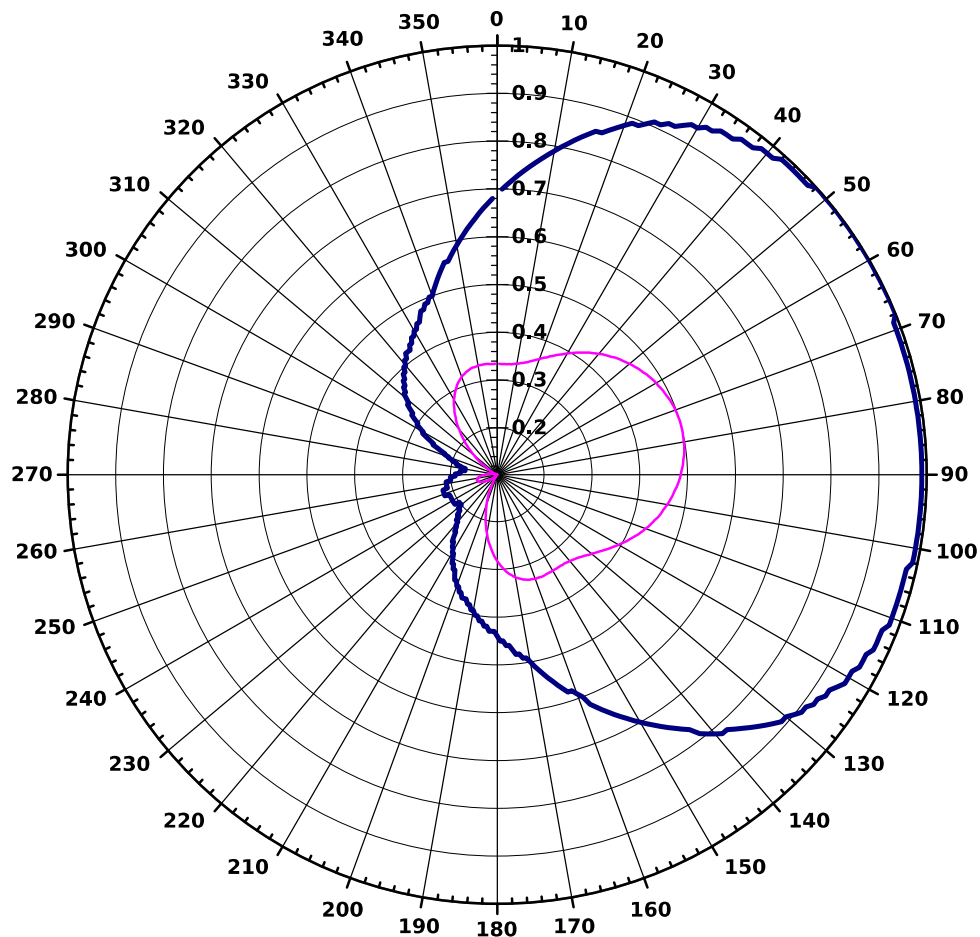
## AZIMUTH PATTERN: Dielectric TFU-14ETT/VP-R 4C230

Main beam axis of symmetry: 75° true

Electrical Beam Tilt: 0.75

Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak)	2.24	(3.49 dBd)
Main Beam Calculated Max. V-pol Azimuth Pattern Gain (peak)	2.44	(3.88 dBd)
Maximum Main Beam H-Pol. Effective Radiated Power (ERP):	235.0 kW	23.71 dBk
Maximum Main Beam V-Pol. Effective Radiated Power (ERP):	58.75 kW	17.69 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

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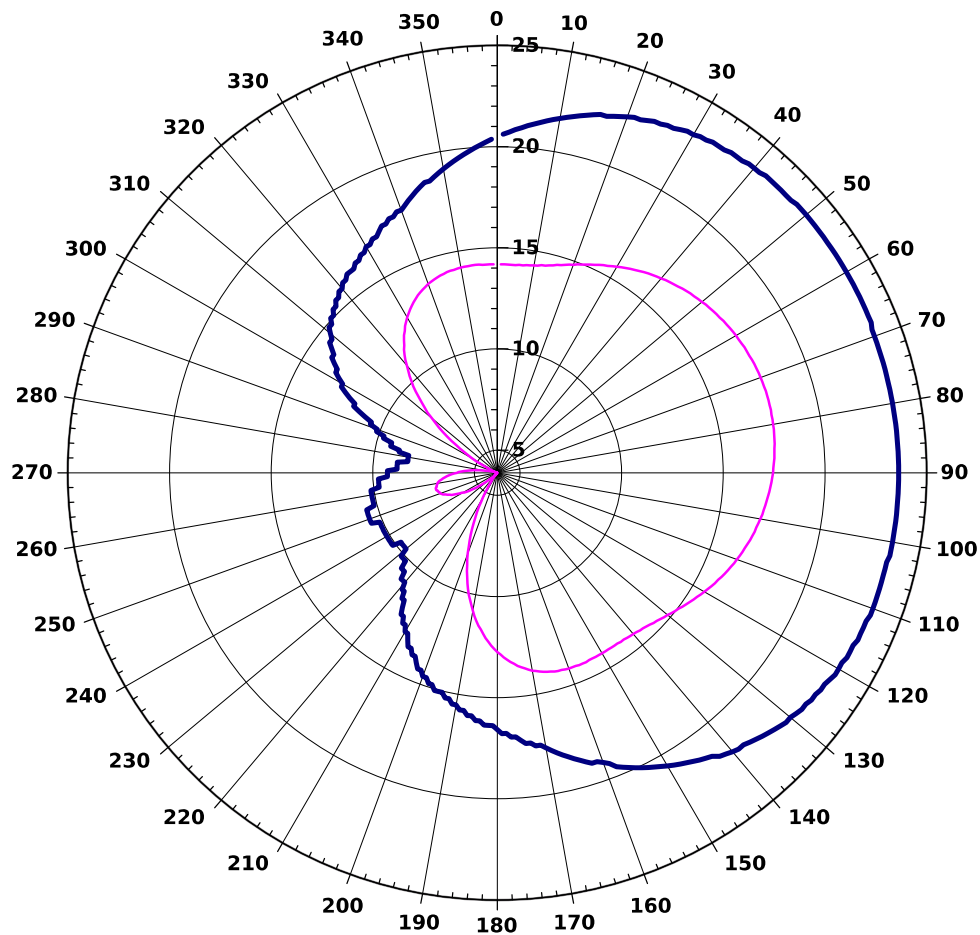
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Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 58.75 kW 17.69 dBk

## AZIMUTH PATTERN ERP (dBk)



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

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## ELEVATION PATTERN Dielectric TFU-14ETT/VP-R 4C230

Electrical Beam Tilt: 0.75°

Calculated Maximum Elevation Gain (H + V polarization):

13.40 11.27 dBd

RMS Gain at Horizontal (H + V polarization):

12.00 10.79 dBd

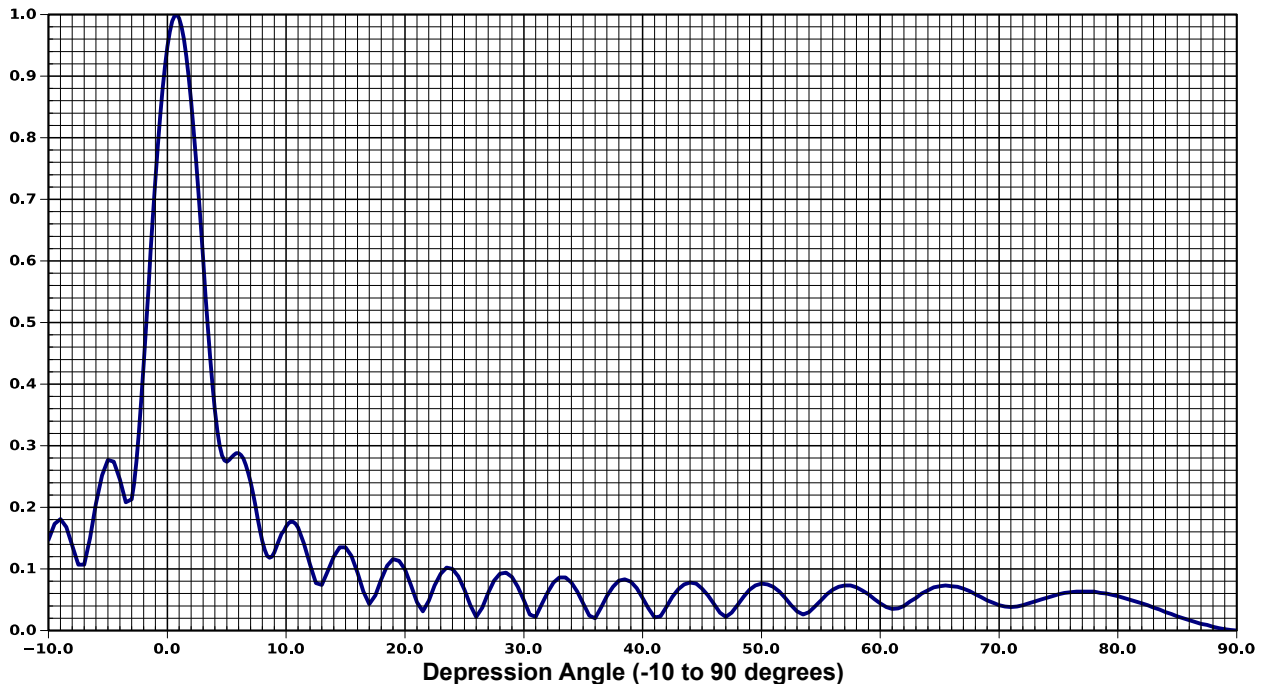
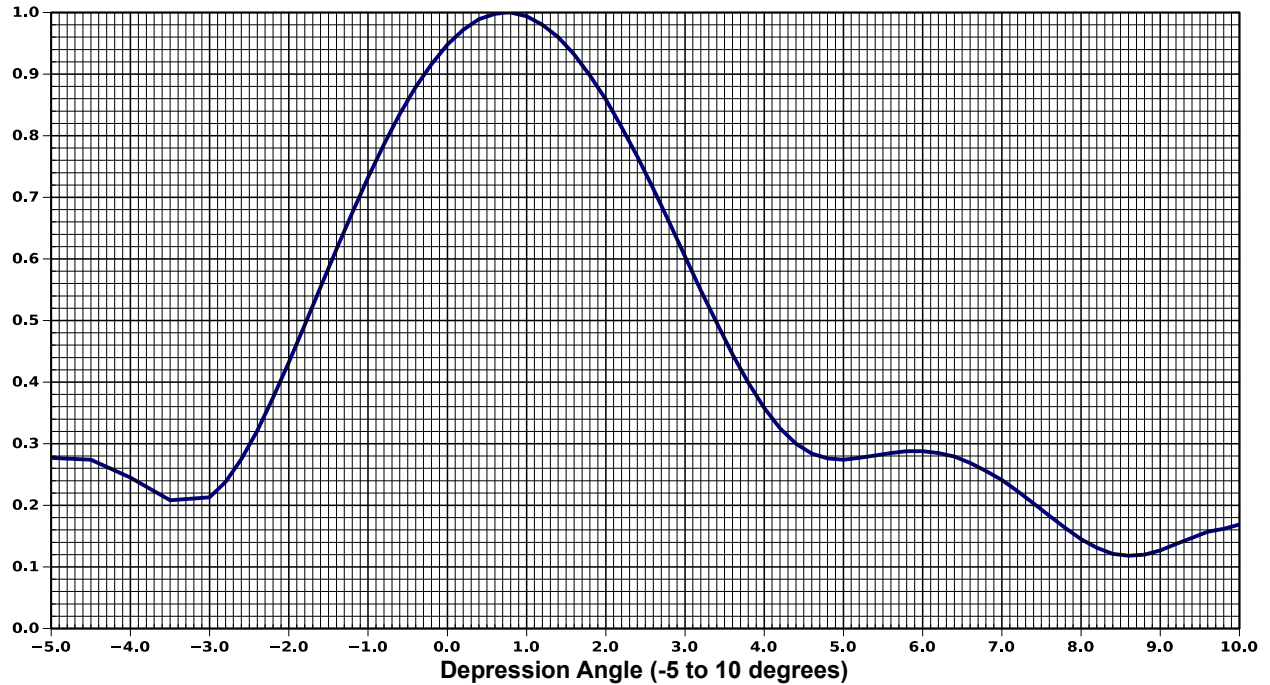
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58.75 kW 17.69 dBk

### Relative Field



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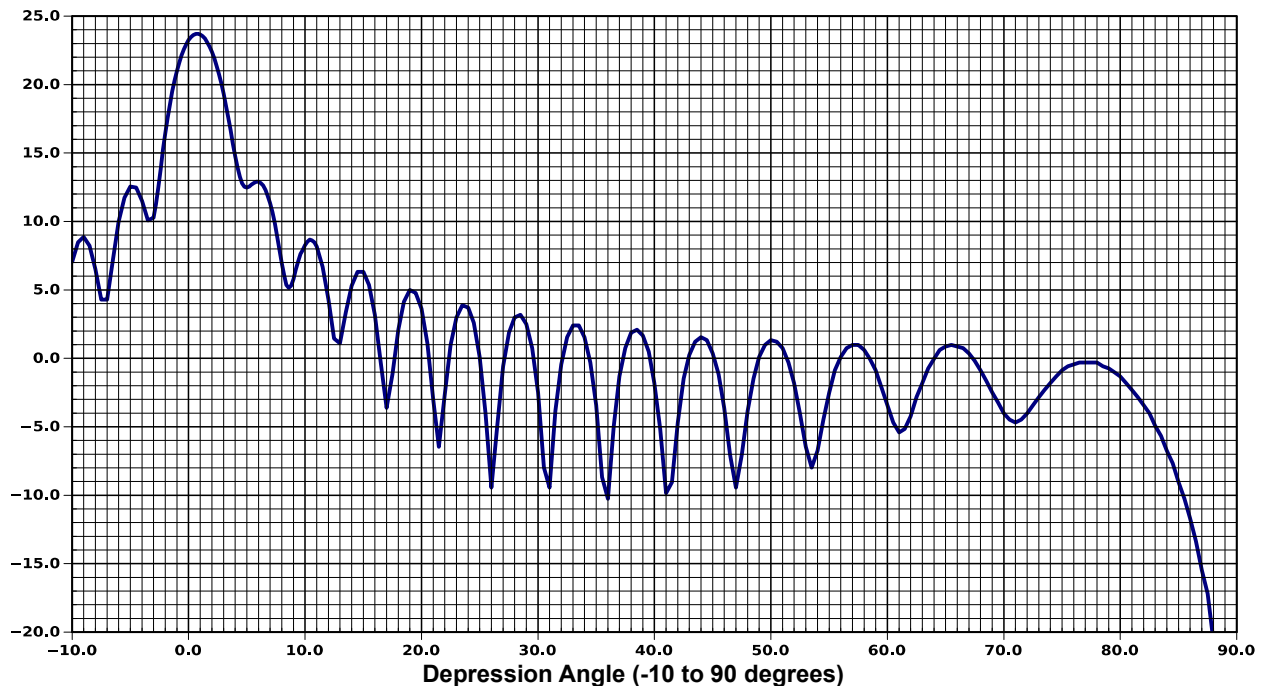
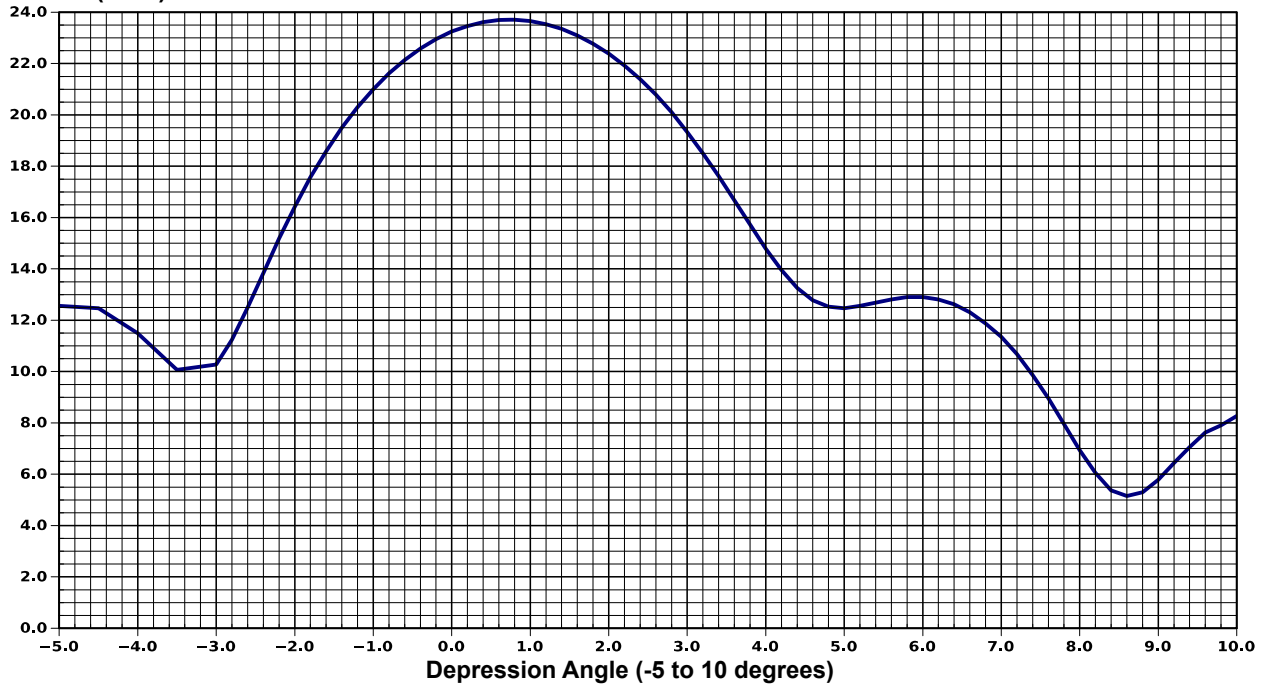
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ERP (dBK)



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Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.147	1.00	0.994	8.00	0.145	21.0	0.046	38.5	0.083	56.0	0.066	73.5	0.050
-9.50	0.173	1.20	0.980	8.20	0.131	21.5	0.031	39.0	0.079	56.5	0.071	74.0	0.053
-9.00	0.181	1.40	0.960	8.40	0.121	22.0	0.048	39.5	0.069	57.0	0.073	74.5	0.056
-8.50	0.168	1.60	0.932	8.60	0.118	22.5	0.073	40.0	0.053	57.5	0.073	75.0	0.059
-8.00	0.138	1.80	0.898	8.80	0.120	23.0	0.092	40.5	0.036	58.0	0.070	75.5	0.061
-7.50	0.107	2.00	0.859	9.00	0.127	23.5	0.102	41.0	0.021	58.5	0.065	76.0	0.062
-7.00	0.107	2.20	0.814	9.20	0.137	24.0	0.100	41.5	0.023	59.0	0.059	76.5	0.063
-6.50	0.150	2.40	0.766	9.40	0.147	24.5	0.088	42.0	0.038	59.5	0.051	77.0	0.063
-6.00	0.206	2.60	0.714	9.60	0.157	25.0	0.066	42.5	0.055	60.0	0.044	77.5	0.063
-5.50	0.252	2.80	0.660	9.80	0.162	25.5	0.041	43.0	0.067	60.5	0.038	78.0	0.063
-5.00	0.277	3.00	0.604	10.0	0.169	26.0	0.022	43.5	0.075	61.0	0.035	78.5	0.061
-4.50	0.274	3.20	0.549	10.2	0.174	26.5	0.037	44.0	0.078	61.5	0.036	79.0	0.060
-4.00	0.245	3.40	0.496	10.4	0.177	27.0	0.061	44.5	0.076	62.0	0.040	79.5	0.058
-3.50	0.208	3.60	0.445	10.6	0.176	27.5	0.081	45.0	0.068	62.5	0.047	80.0	0.056
-3.00	0.213	3.80	0.399	10.8	0.173	28.0	0.092	45.5	0.057	63.0	0.053	80.5	0.053
-2.80	0.238	4.00	0.358	11.0	0.167	28.5	0.094	46.0	0.043	63.5	0.060	81.0	0.050
-2.60	0.275	4.20	0.325	11.5	0.141	29.0	0.087	46.5	0.029	64.0	0.065	81.5	0.047
-2.40	0.321	4.40	0.300	12.0	0.107	29.5	0.071	47.0	0.022	64.5	0.070	82.0	0.044
-2.20	0.375	4.60	0.284	12.5	0.077	30.0	0.049	47.5	0.029	65.0	0.072	82.5	0.041
-2.00	0.432	4.80	0.276	13.0	0.074	30.5	0.026	48.0	0.042	65.5	0.073	83.0	0.037
-1.80	0.493	5.00	0.274	13.5	0.096	31.0	0.022	48.5	0.055	66.0	0.072	83.5	0.034
-1.60	0.554	5.20	0.277	14.0	0.120	31.5	0.042	49.0	0.066	66.5	0.071	84.0	0.030
-1.40	0.616	5.40	0.281	14.5	0.135	32.0	0.062	49.5	0.073	67.0	0.068	84.5	0.027
-1.20	0.675	5.60	0.285	15.0	0.135	32.5	0.078	50.0	0.076	67.5	0.064	85.0	0.023
-1.00	0.732	5.80	0.288	15.5	0.121	33.0	0.086	50.5	0.075	68.0	0.059	85.5	0.020
-0.80	0.786	6.00	0.288	16.0	0.094	33.5	0.086	51.0	0.071	68.5	0.054	86.0	0.017
-0.60	0.835	6.20	0.285	16.5	0.063	34.0	0.078	51.5	0.063	69.0	0.049	86.5	0.014
-0.40	0.879	6.40	0.279	17.0	0.043	34.5	0.063	52.0	0.053	69.5	0.045	87.0	0.011
-0.20	0.916	6.60	0.269	17.5	0.057	35.0	0.044	52.5	0.041	70.0	0.041	87.5	0.009
0.00	0.948	6.80	0.256	18.0	0.083	35.5	0.024	53.0	0.031	70.5	0.039	88.0	0.006
0.20	0.972	7.00	0.241	18.5	0.105	36.0	0.020	53.5	0.026	71.0	0.038	88.5	0.004
0.40	0.989	7.20	0.223	19.0	0.116	36.5	0.037	54.0	0.030	71.5	0.039	89.0	0.002
0.60	0.998	7.40	0.203	19.5	0.113	37.0	0.056	54.5	0.039	72.0	0.041	89.5	0.001
0.75	1.000	7.60	0.183	20.0	0.099	37.5	0.071	55.0	0.049	72.5	0.044	90.0	0.000
0.80	1.000	7.80	0.163	20.5	0.074	38.0	0.081	55.5	0.059	73.0	0.047		