

**KNSD Application for Auxiliary Broadcast Facility****73.625(c) Data  
November 10, 2021****AZIMUTH PATTERN (H-pol): Dielectric TFU-12DSB-M/VP**

Main beam axis of symmetry: 290° true

Electrical Beam Tilt: 1.70°

Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak): 1.84 (2.65 dBd)

Maximum Main Beam H-Pol. Effective Radiated Power (ERP): 210.0 kW 23.22 dBk

Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 52.5 kW 17.20 dBk

**Tabulation of Azimuth Pattern (Horizontal polarization)**

| Angle | RF    | dBk   | ERP kW |
|-------|-------|-------|--------|
| 0     | 0.970 | 22.96 | 197.6  |
| 10    | 0.920 | 22.50 | 177.7  |
| 20    | 0.850 | 21.81 | 151.7  |
| 30    | 0.750 | 20.72 | 118.1  |
| 40    | 0.630 | 19.21 | 83.3   |
| 50    | 0.480 | 16.85 | 48.4   |
| 60    | 0.330 | 13.59 | 22.9   |
| 70    | 0.180 | 8.33  | 6.8    |
| 80    | 0.140 | 6.14  | 4.1    |
| 90    | 0.220 | 10.07 | 10.2   |
| 100   | 0.300 | 12.76 | 18.9   |
| 110   | 0.320 | 13.33 | 21.5   |
| 120   | 0.280 | 12.17 | 16.5   |
| 130   | 0.190 | 8.80  | 7.6    |
| 140   | 0.110 | 4.05  | 2.5    |
| 150   | 0.210 | 9.67  | 9.3    |
| 160   | 0.360 | 14.35 | 27.2   |
| 170   | 0.520 | 17.54 | 56.8   |
| 180   | 0.660 | 19.61 | 91.5   |
| 190   | 0.770 | 20.95 | 124.5  |
| 200   | 0.860 | 21.91 | 155.3  |
| 210   | 0.930 | 22.59 | 181.6  |
| 220   | 0.980 | 23.05 | 201.7  |
| 230   | 1.000 | 23.22 | 210.0  |
| 240   | 0.990 | 23.13 | 205.8  |
| 250   | 0.970 | 22.96 | 197.6  |
| 260   | 0.930 | 22.59 | 181.6  |
| 270   | 0.890 | 22.21 | 166.3  |
| 280   | 0.860 | 21.91 | 155.3  |
| 290   | 0.850 | 21.81 | 151.7  |
| 300   | 0.860 | 21.91 | 155.3  |
| 310   | 0.890 | 22.21 | 166.3  |
| 320   | 0.930 | 22.59 | 181.6  |
| 330   | 0.970 | 22.96 | 197.6  |
| 340   | 0.990 | 23.13 | 205.8  |
| 350   | 1.000 | 23.22 | 210.0  |

**Maximum**

| Angle | RF    | dBk   |
|-------|-------|-------|
| 109   | 0.320 | 13.33 |
| 232   | 1.000 | 23.22 |
| 349   | 1.000 | 23.22 |

**Minimum**

| Angle | RF    | dBk   |
|-------|-------|-------|
| 79    | 0.140 | 6.14  |
| 140   | 0.110 | 4.05  |
| 290   | 0.850 | 21.81 |

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Main beam axis of symmetry: 290° true

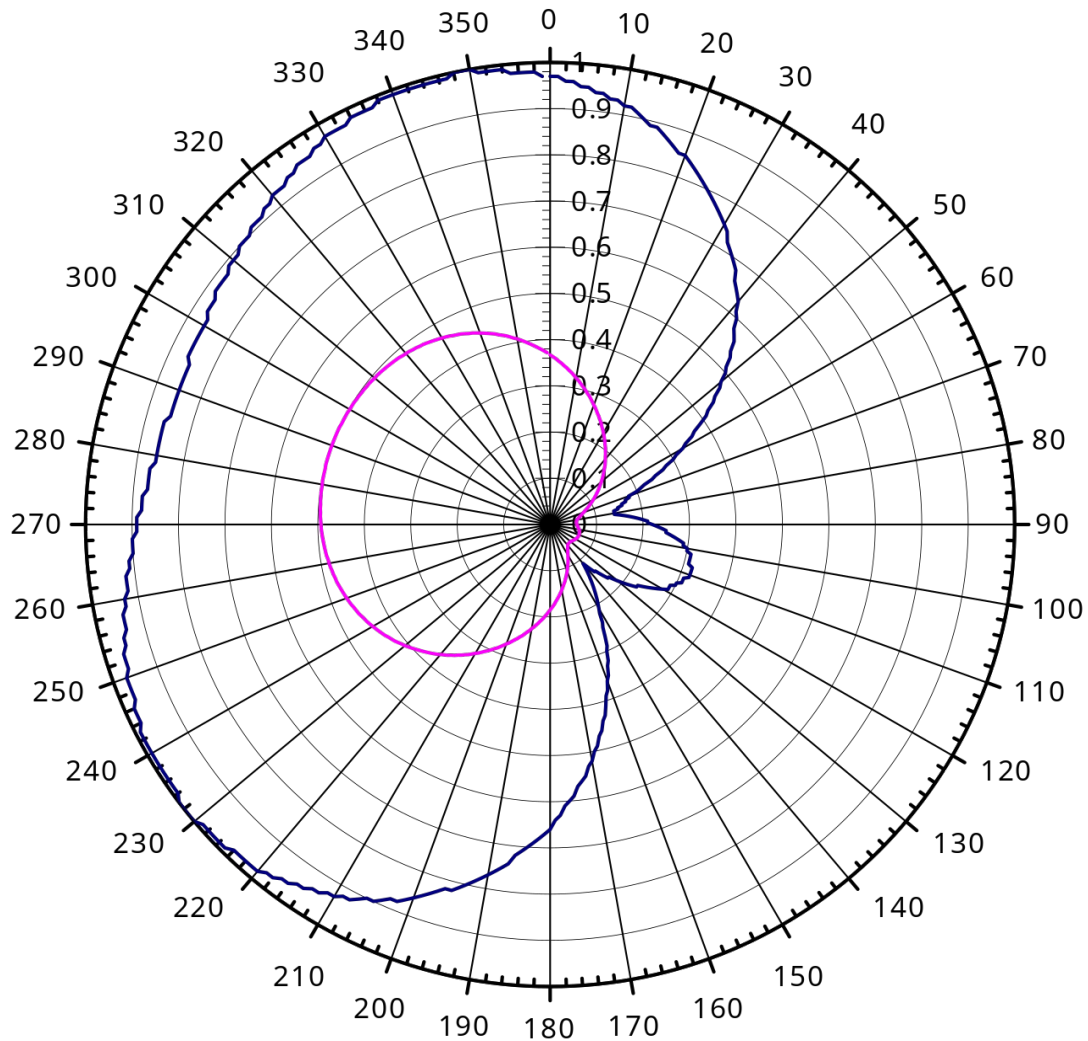
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### AZIMUTH PATTERN RELATIVE FIELD



Blue plot shows azimuth pattern horizontally polarized relative field  
Magenta plot shows azimuth pattern vertically polarized relative field

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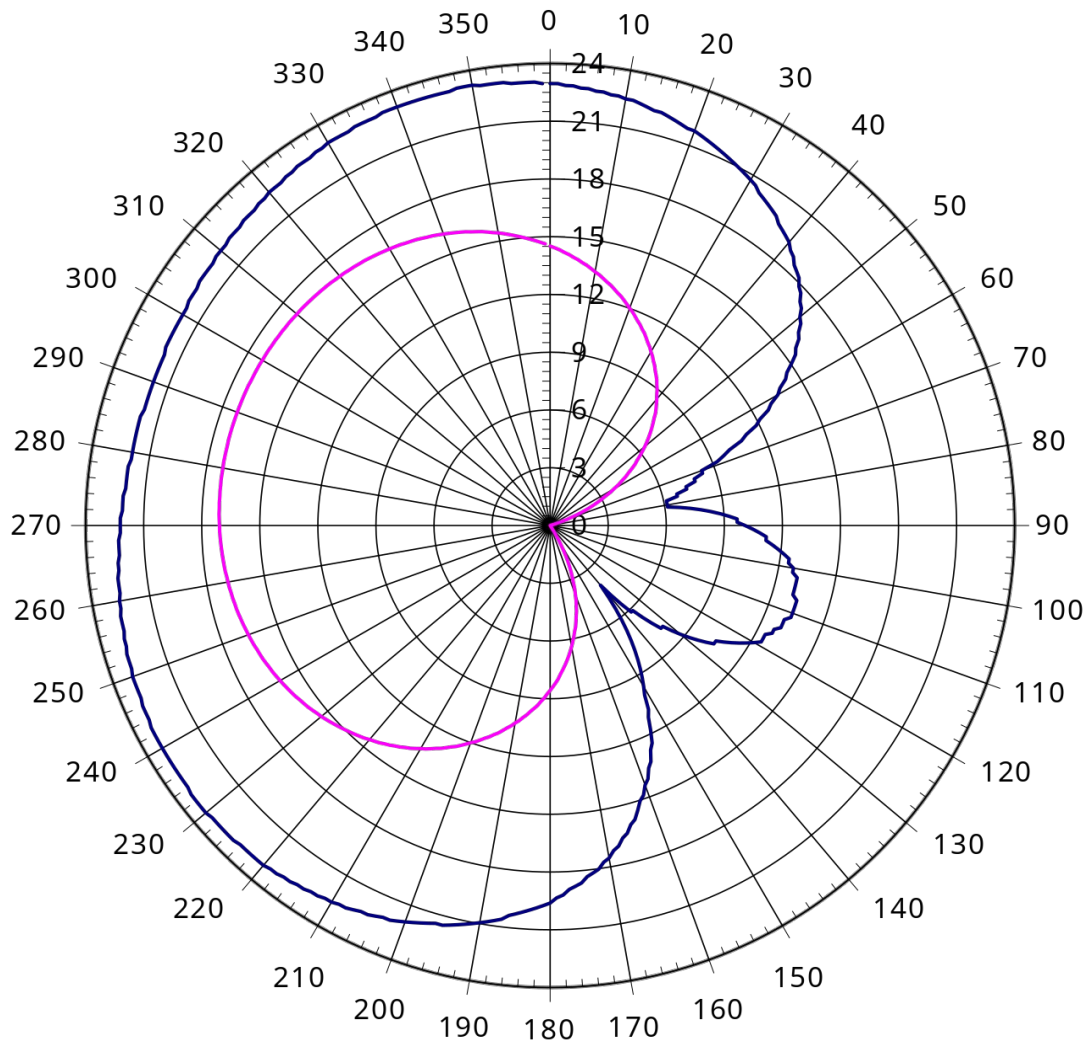
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### AZIMUTH PATTERN ERP (dBk)



Blue plot shows horizontally polarized effective radiated power (dBk)

Magenta plot shows vertically polarized effective radiated power (dBk)

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## ELEVATION PATTERN Dielectric TFU-12DSB-M/VP

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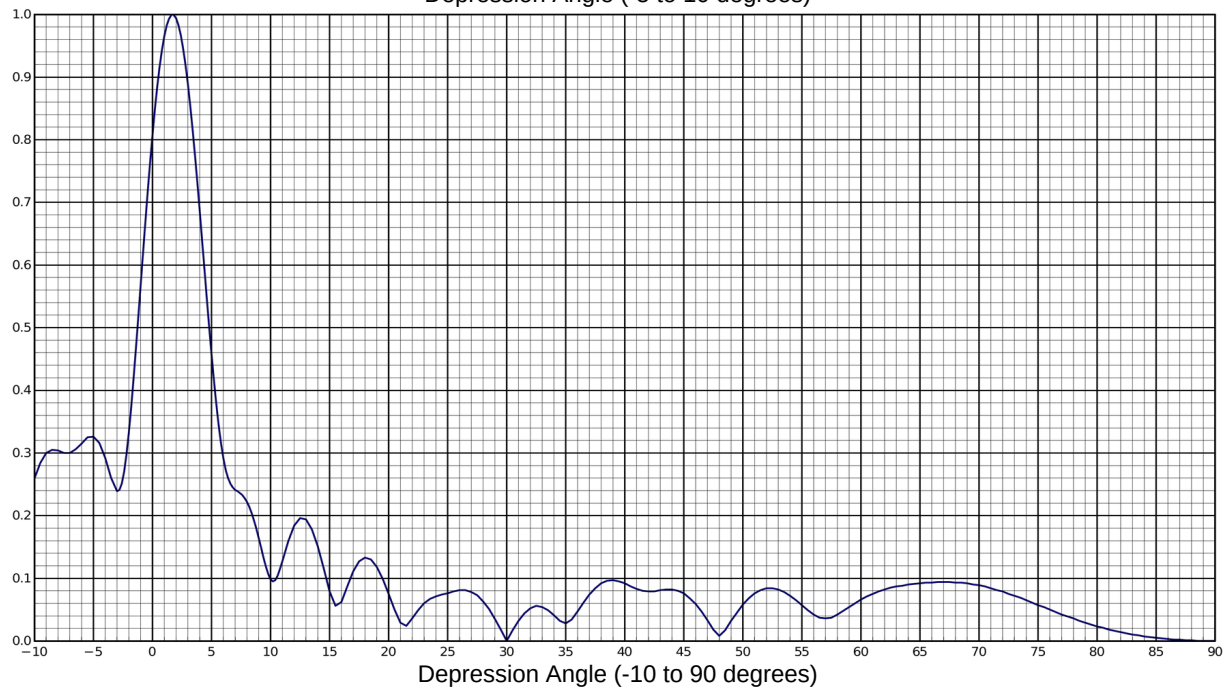
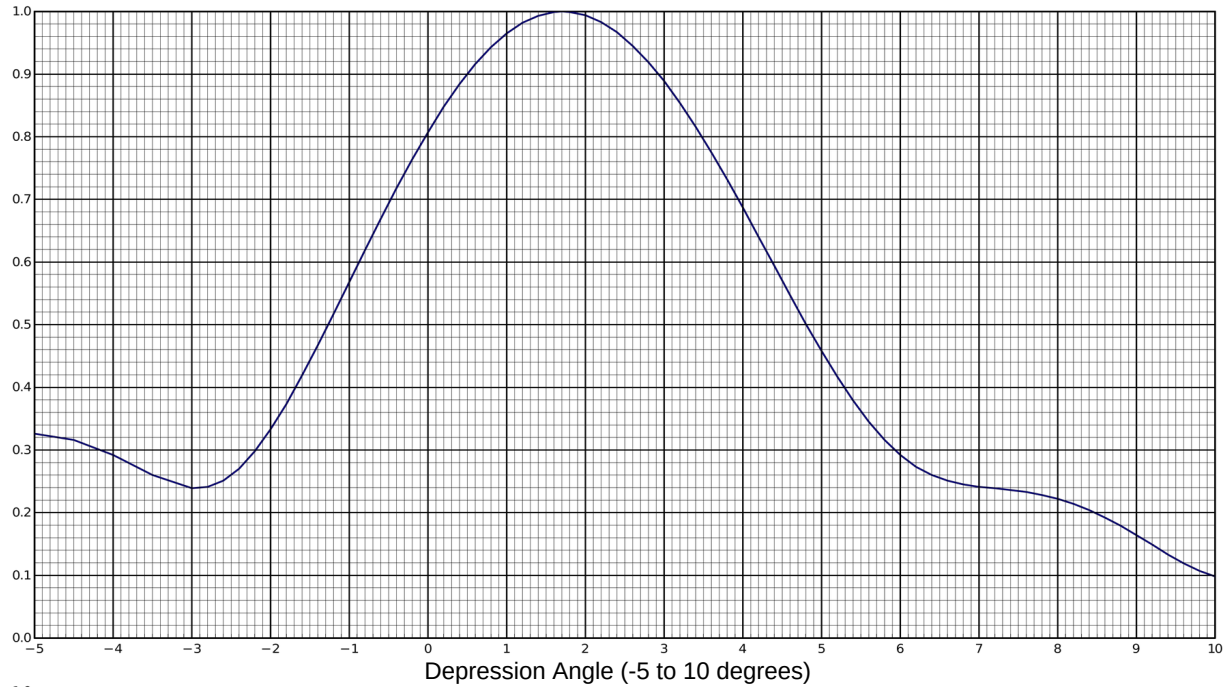
Calculated Maximum Elevation Gain (H polarization): 10.70 10.29 dBd

RMS Gain at Horizontal (H polarization): 7.00 8.45 dBd

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### Relative Field



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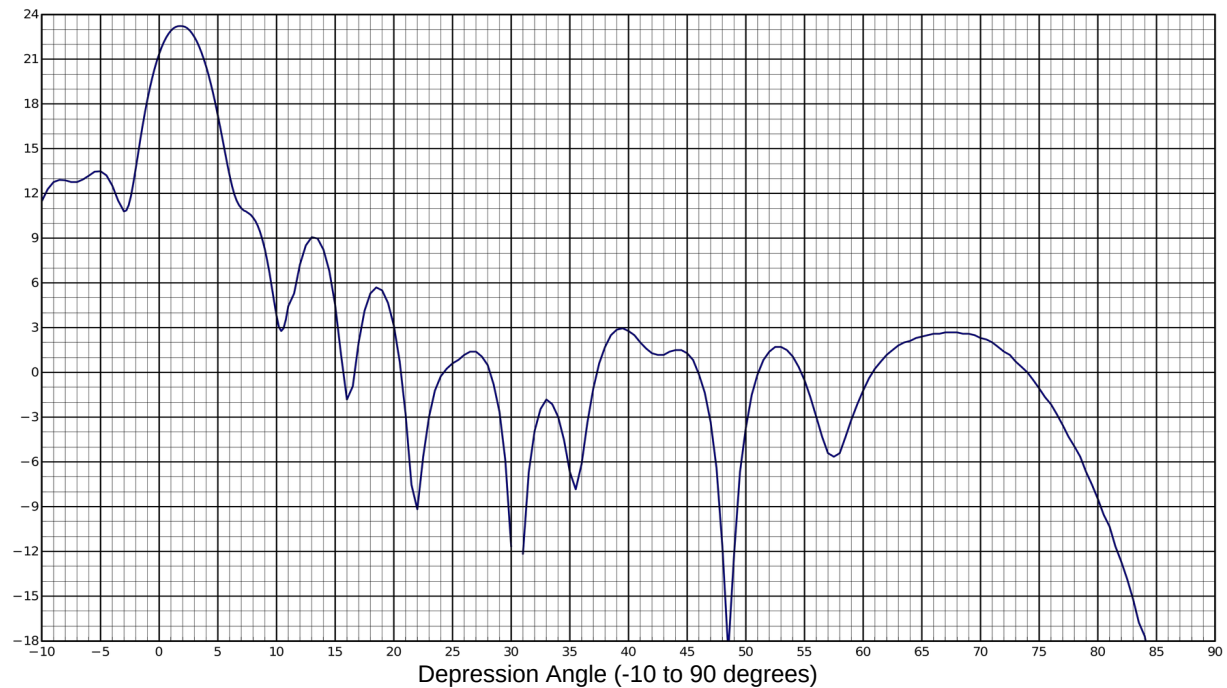
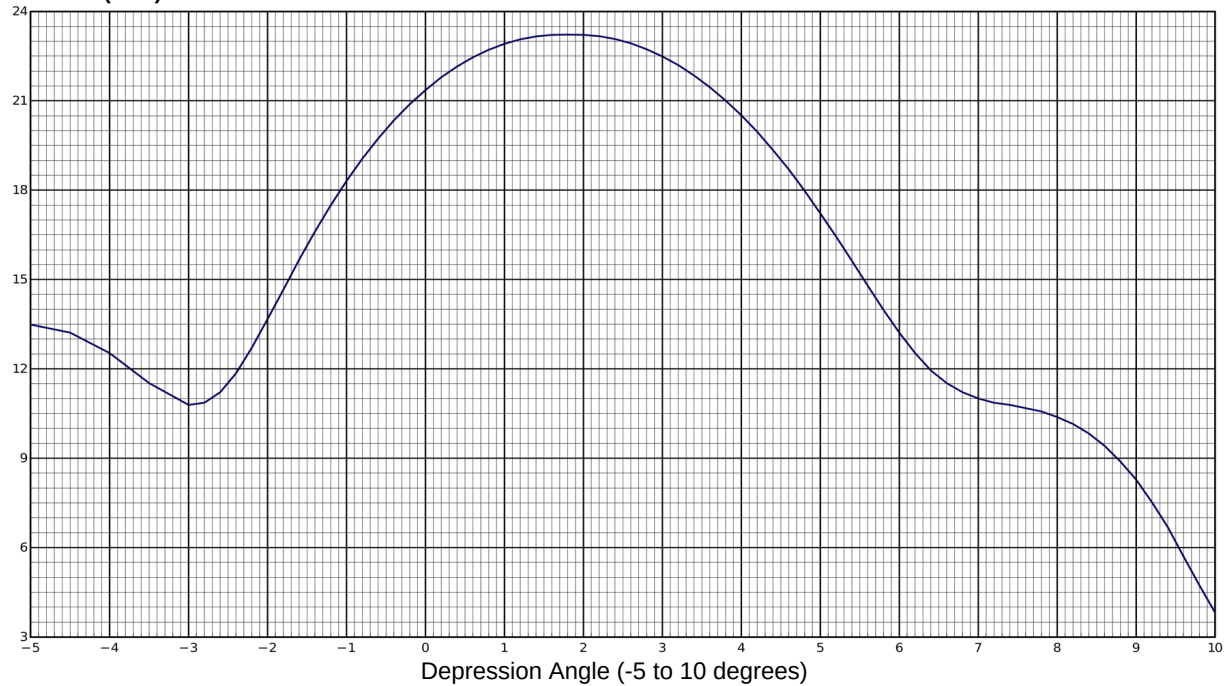
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ERP (dBK)



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### Elevation Pattern Tabulation:

| Angle       | Field        | Angle       | Field        | Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field |
|-------------|--------------|-------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| -10.0       | 0.259        | 1.20        | 0.982        | 8.00  | 0.222 | 21.0  | 0.029 | 38.5  | 0.096 | 56.0  | 0.042 | 73.5  | 0.069 |
| -9.50       | 0.284        | 1.40        | 0.993        | 8.20  | 0.214 | 21.5  | 0.024 | 39.0  | 0.097 | 56.5  | 0.037 | 74.0  | 0.065 |
| -9.00       | 0.300        | 1.60        | 0.999        | 8.40  | 0.204 | 22.0  | 0.036 | 39.5  | 0.095 | 57.0  | 0.036 | 74.5  | 0.061 |
| -8.50       | 0.305        | <b>1.70</b> | <b>1.000</b> | 8.60  | 0.192 | 22.5  | 0.049 | 40.0  | 0.092 | 57.5  | 0.037 | 75.0  | 0.057 |
| -8.00       | 0.304        | 1.80        | 0.999        | 8.80  | 0.179 | 23.0  | 0.060 | 40.5  | 0.087 | 58.0  | 0.042 | 75.5  | 0.054 |
| -7.50       | 0.300        | 2.00        | 0.994        | 9.00  | 0.164 | 23.5  | 0.067 | 41.0  | 0.083 | 58.5  | 0.048 | 76.0  | 0.050 |
| -7.00       | 0.300        | 2.20        | 0.983        | 9.20  | 0.149 | 24.0  | 0.071 | 41.5  | 0.080 | 59.0  | 0.054 | 76.5  | 0.046 |
| -6.50       | 0.306        | 2.40        | 0.967        | 9.40  | 0.133 | 24.5  | 0.074 | 42.0  | 0.079 | 59.5  | 0.060 | 77.0  | 0.042 |
| -6.00       | 0.315        | 2.60        | 0.945        | 9.60  | 0.119 | 25.0  | 0.076 | 42.5  | 0.079 | 60.0  | 0.066 | 77.5  | 0.039 |
| -5.50       | 0.325        | 2.80        | 0.919        | 9.80  | 0.107 | 25.5  | 0.079 | 43.0  | 0.081 | 60.5  | 0.071 | 78.0  | 0.036 |
| -5.00       | 0.326        | 3.00        | 0.889        | 10.0  | 0.098 | 26.0  | 0.081 | 43.5  | 0.082 | 61.0  | 0.075 | 78.5  | 0.032 |
| -4.50       | 0.316        | 3.20        | 0.854        | 10.2  | 0.095 | 26.5  | 0.081 | 44.0  | 0.082 | 61.5  | 0.079 | 79.0  | 0.029 |
| -4.00       | 0.292        | 3.40        | 0.816        | 10.4  | 0.097 | 27.0  | 0.078 | 44.5  | 0.080 | 62.0  | 0.082 | 79.5  | 0.026 |
| -3.50       | 0.260        | 3.60        | 0.775        | 10.6  | 0.104 | 27.5  | 0.073 | 45.0  | 0.076 | 62.5  | 0.085 | 80.0  | 0.023 |
| -3.00       | 0.239        | 3.80        | 0.732        | 10.8  | 0.115 | 28.0  | 0.063 | 45.5  | 0.068 | 63.0  | 0.087 | 80.5  | 0.021 |
| -2.80       | 0.241        | 4.00        | 0.687        | 11.0  | 0.127 | 28.5  | 0.051 | 46.0  | 0.059 | 63.5  | 0.088 | 81.0  | 0.018 |
| -2.60       | 0.251        | 4.20        | 0.640        | 11.5  | 0.159 | 29.0  | 0.035 | 46.5  | 0.047 | 64.0  | 0.090 | 81.5  | 0.016 |
| -2.40       | 0.270        | 4.40        | 0.594        | 12.0  | 0.184 | 29.5  | 0.018 | 47.0  | 0.033 | 64.5  | 0.091 | 82.0  | 0.014 |
| -2.20       | 0.298        | 4.60        | 0.547        | 12.5  | 0.196 | 30.0  | 0.000 | 47.5  | 0.018 | 65.0  | 0.092 | 82.5  | 0.012 |
| -2.00       | 0.333        | 4.80        | 0.501        | 13.0  | 0.194 | 30.5  | 0.017 | 48.0  | 0.008 | 65.5  | 0.093 | 83.0  | 0.010 |
| -1.80       | 0.373        | 5.00        | 0.458        | 13.5  | 0.178 | 31.0  | 0.032 | 48.5  | 0.017 | 66.0  | 0.093 | 83.5  | 0.009 |
| -1.60       | 0.419        | 5.20        | 0.417        | 14.0  | 0.151 | 31.5  | 0.044 | 49.0  | 0.032 | 66.5  | 0.094 | 84.0  | 0.007 |
| -1.40       | 0.467        | 5.40        | 0.379        | 14.5  | 0.116 | 32.0  | 0.052 | 49.5  | 0.045 | 67.0  | 0.094 | 84.5  | 0.006 |
| -1.20       | 0.517        | 5.60        | 0.345        | 15.0  | 0.079 | 32.5  | 0.056 | 50.0  | 0.058 | 67.5  | 0.094 | 85.0  | 0.005 |
| -1.00       | 0.568        | 5.80        | 0.316        | 15.5  | 0.056 | 33.0  | 0.054 | 50.5  | 0.068 | 68.0  | 0.093 | 85.5  | 0.004 |
| -0.80       | 0.619        | 6.00        | 0.292        | 16.0  | 0.062 | 33.5  | 0.049 | 51.0  | 0.076 | 68.5  | 0.093 | 86.0  | 0.003 |
| -0.60       | 0.669        | 6.20        | 0.273        | 16.5  | 0.087 | 34.0  | 0.041 | 51.5  | 0.081 | 69.0  | 0.092 | 86.5  | 0.002 |
| -0.40       | 0.718        | 6.40        | 0.260        | 17.0  | 0.111 | 34.5  | 0.032 | 52.0  | 0.084 | 69.5  | 0.090 | 87.0  | 0.002 |
| -0.20       | 0.764        | 6.60        | 0.251        | 17.5  | 0.127 | 35.0  | 0.028 | 52.5  | 0.084 | 70.0  | 0.089 | 87.5  | 0.001 |
| 0.00        | 0.807        | 6.80        | 0.245        | 18.0  | 0.133 | 35.5  | 0.034 | 53.0  | 0.082 | 70.5  | 0.087 | 88.0  | 0.001 |
| 0.20        | 0.848        | 7.00        | 0.241        | 18.5  | 0.130 | 36.0  | 0.047 | 53.5  | 0.078 | 71.0  | 0.084 | 88.5  | 0.000 |
| 0.40        | 0.884        | 7.20        | 0.239        | 19.0  | 0.118 | 36.5  | 0.061 | 54.0  | 0.072 | 71.5  | 0.081 | 89.0  | 0.000 |
| 0.60        | 0.916        | 7.40        | 0.236        | 19.5  | 0.099 | 37.0  | 0.074 | 54.5  | 0.065 | 72.0  | 0.079 | 89.5  | 0.000 |
| <b>0.80</b> | <b>0.943</b> | 7.60        | 0.233        | 20.0  | 0.075 | 37.5  | 0.084 | 55.0  | 0.057 | 72.5  | 0.075 | 90.0  | 0.000 |
| 1.00        | 0.965        | 7.80        | 0.228        | 20.5  | 0.050 | 38.0  | 0.092 | 55.5  | 0.049 | 73.0  | 0.072 |       |       |