

Antenna Test Report

Manufacture:

Product Name : M6510-4G

Antenna Type:FPC antenna

Test Date:2024/04/08

Tested by: Dai Hao

Approved by:Yu Jianwei

1.General Description

Manufacturer	Tianyutong Electronic Technology Co., Ltd
Address	
Test Location	211 Tairan Industrial and Trade Park, Futian District, Shenzhen City, Guangdong Province
Product Name	M6510-4G
Antenna Type	FPC antenna
test Items	GAIN;Efficiency;Radiation Pattern
Test Frequency	706-2690MHz

2.Test Cdnfigurationont

Test Environment

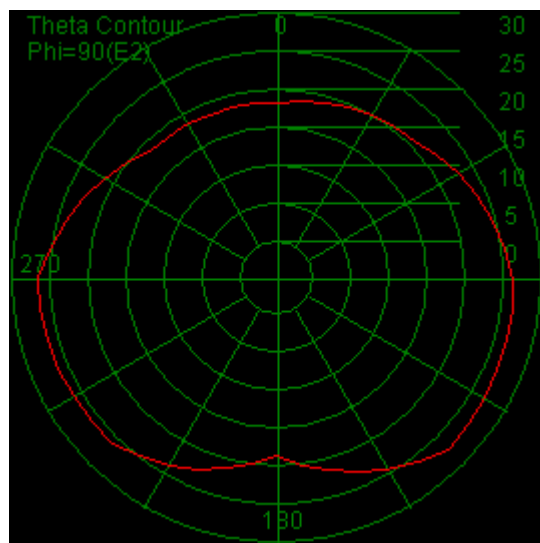
Temperature (°C)	25.5
Humidity (%RH)	60
Atmospheric Pressure(kpa)	101.5

Test Equipment

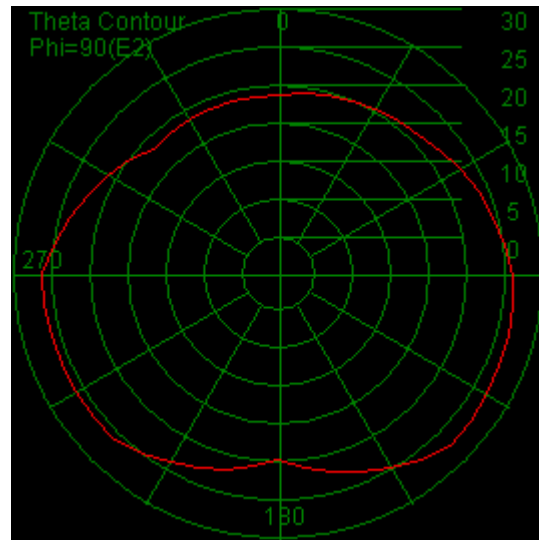
Test Instru ment	R&S ZNB8
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5.1 2D方向图

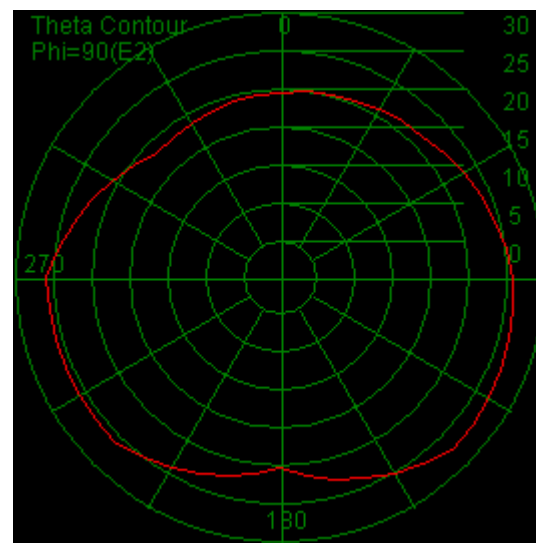
GSM850 128 TRP E2



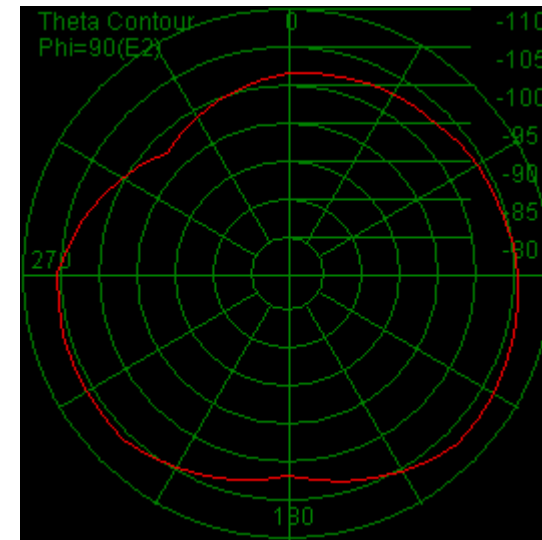
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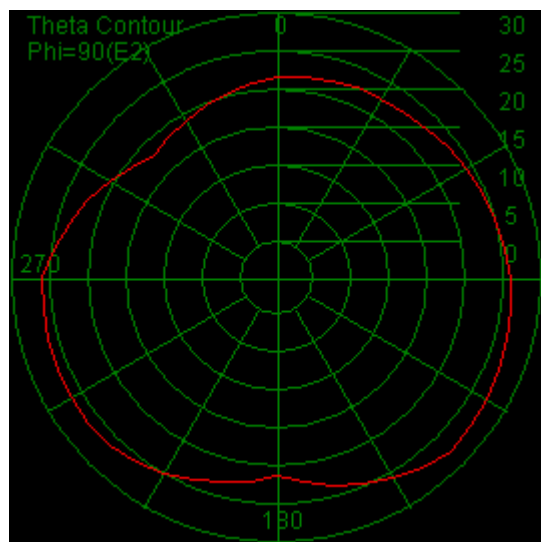
GSM850 251 TRP E2



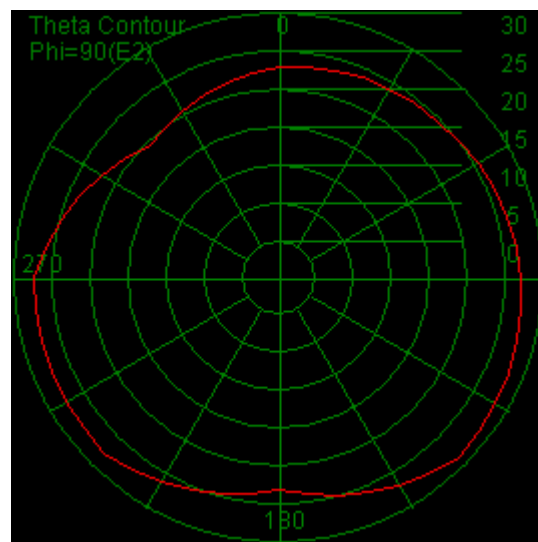
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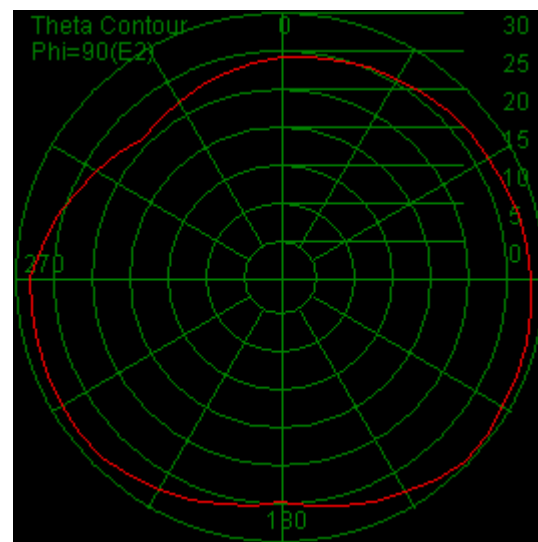
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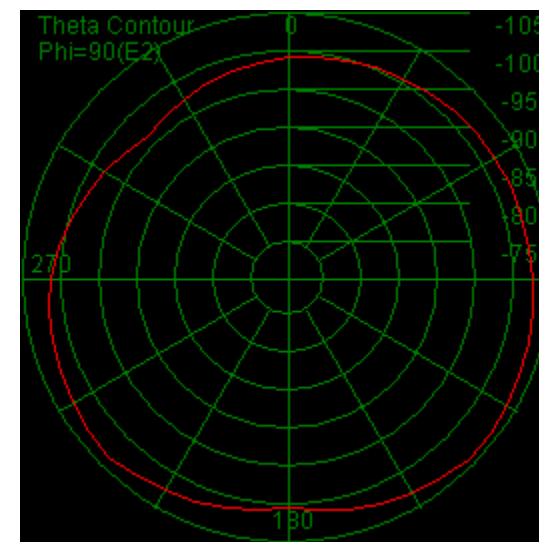
EGSM 62 TRP E2



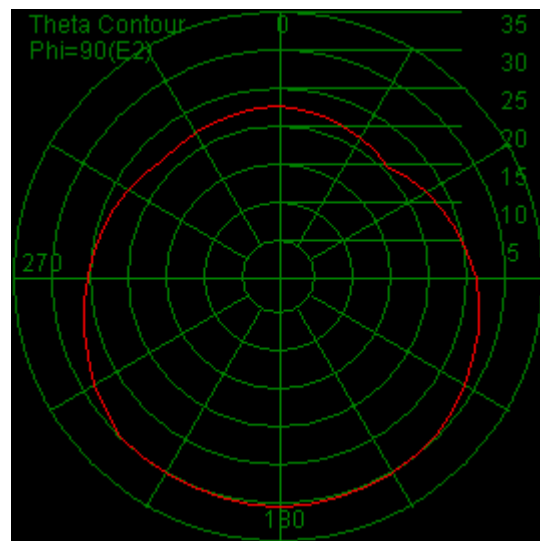
EGSM 124 TRP E2



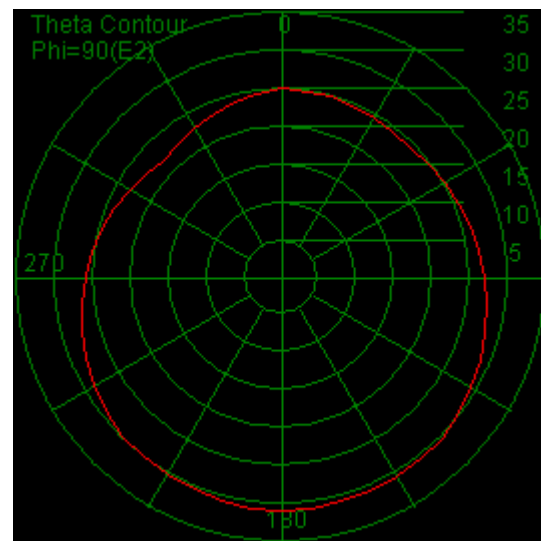
EGSM 124 TIS E2



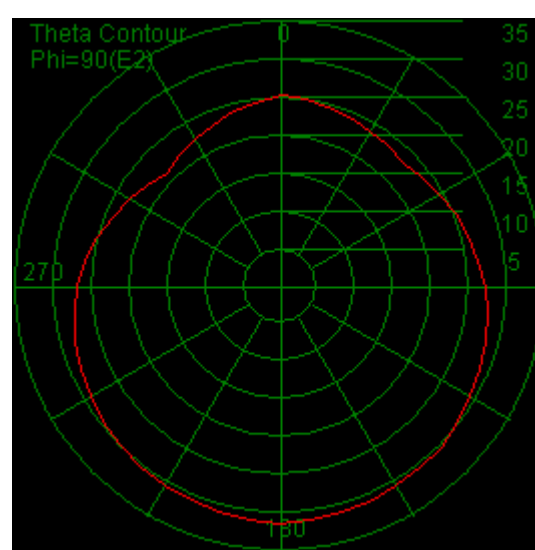
DCS 512 TRP E2



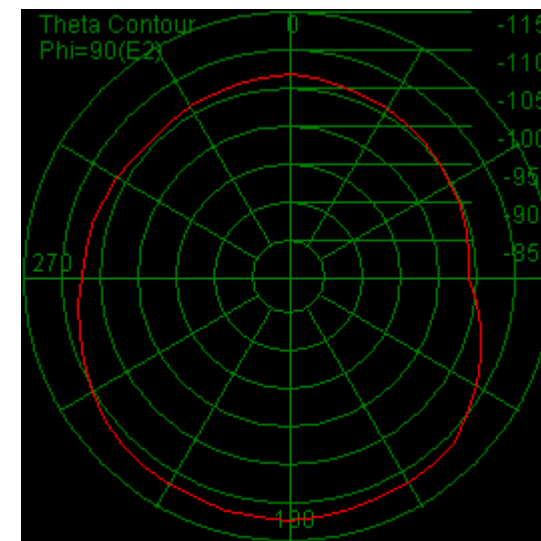
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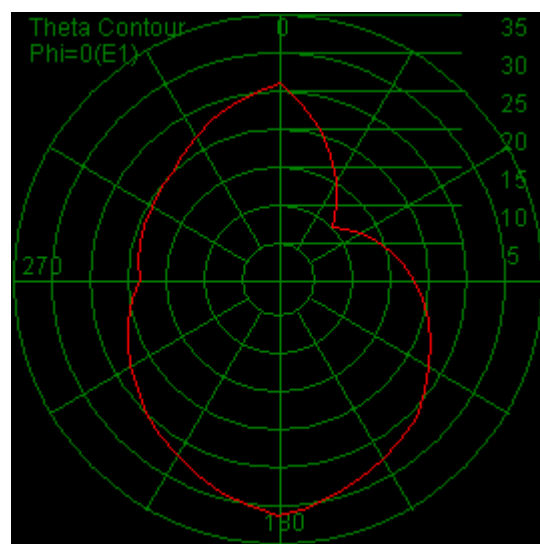
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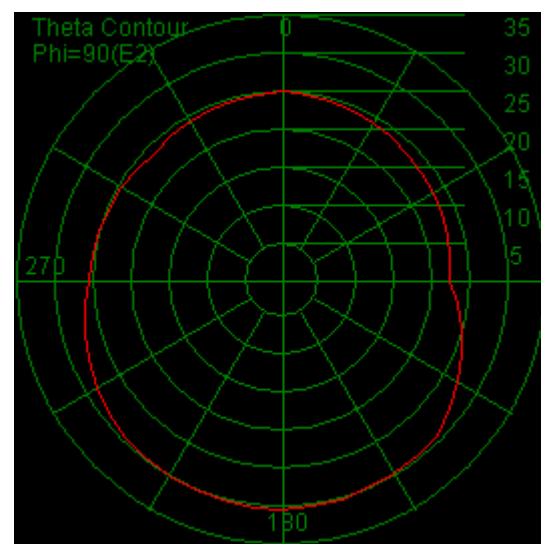
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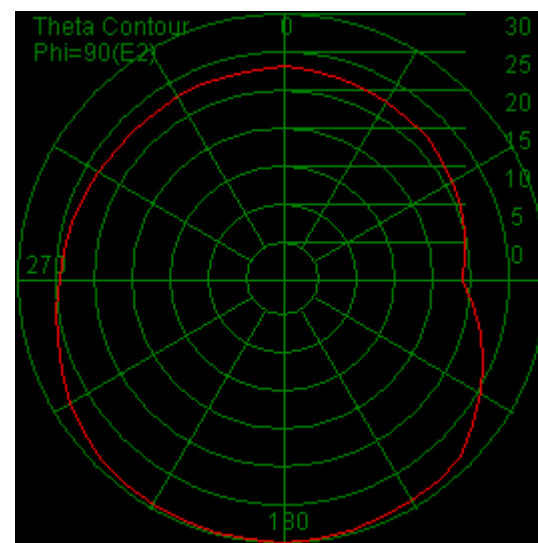
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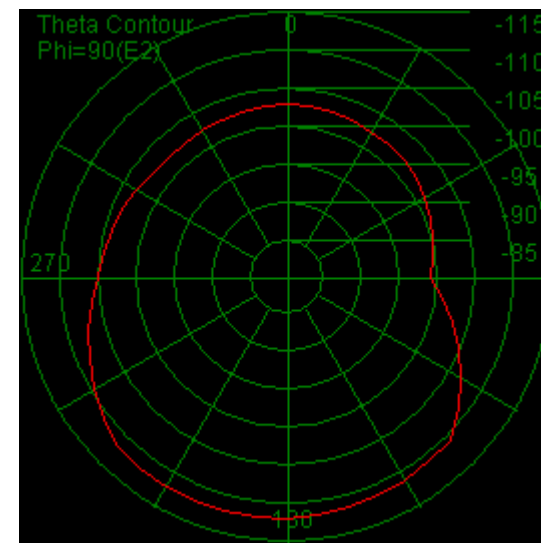
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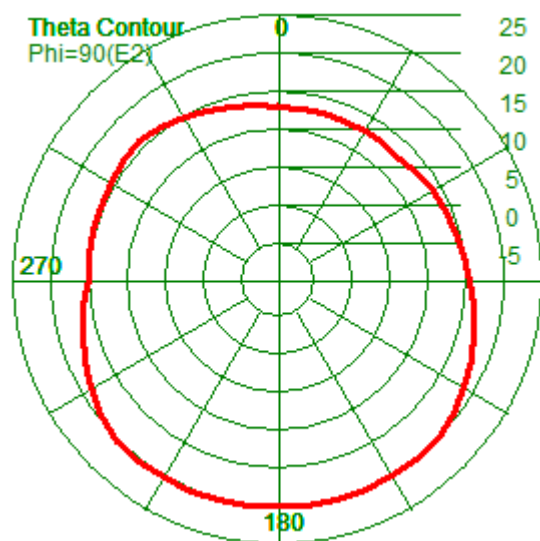
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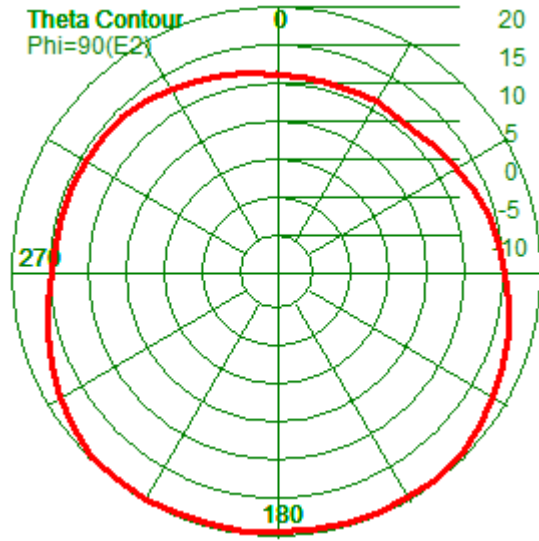
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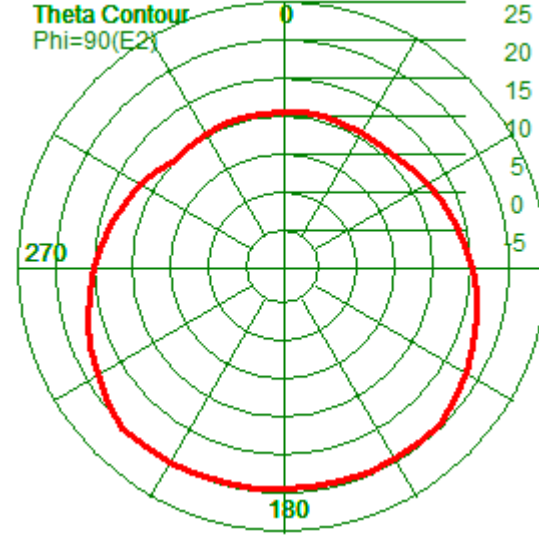
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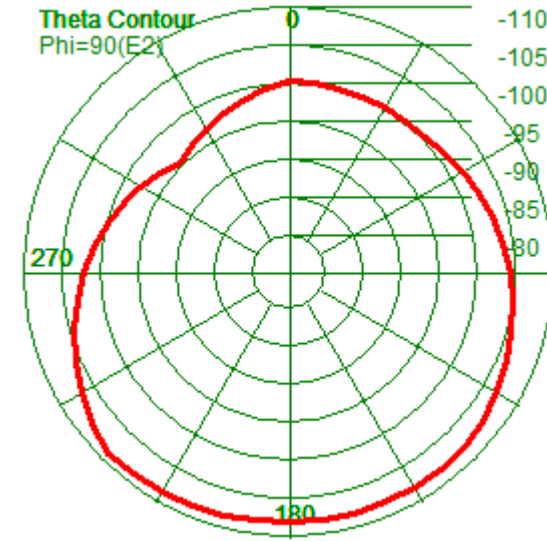
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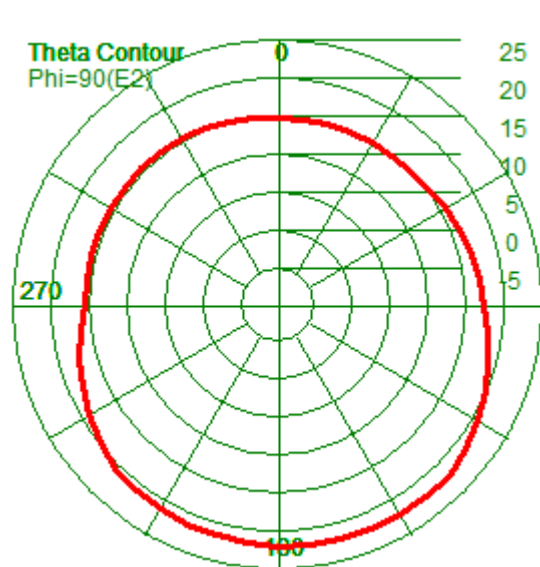
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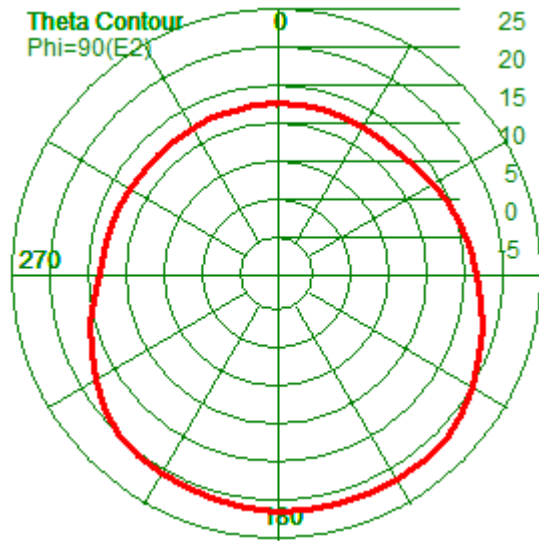
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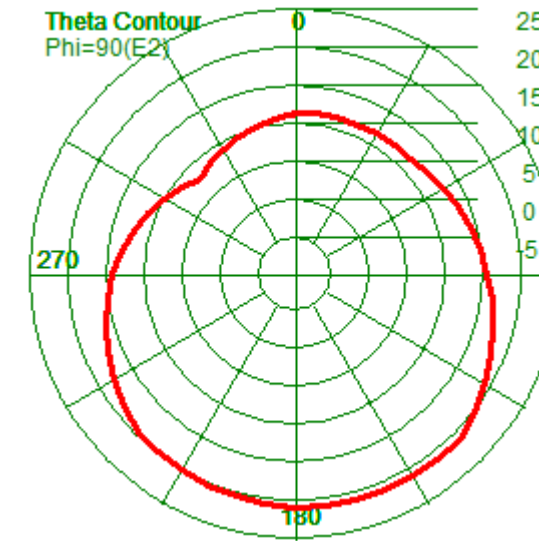
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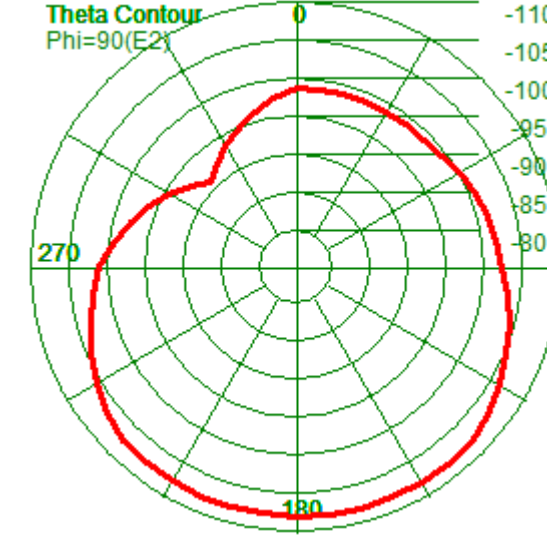
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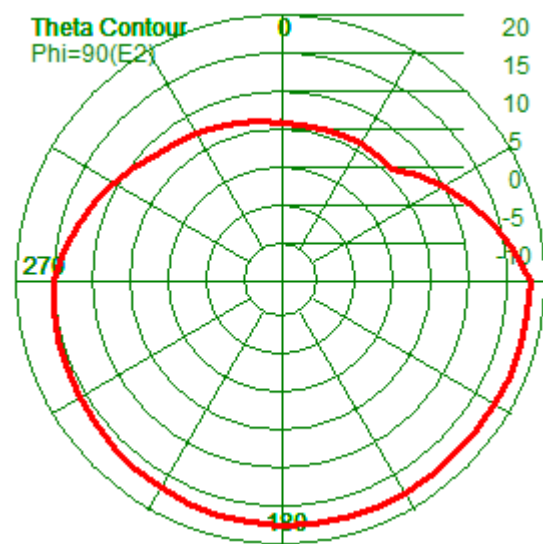
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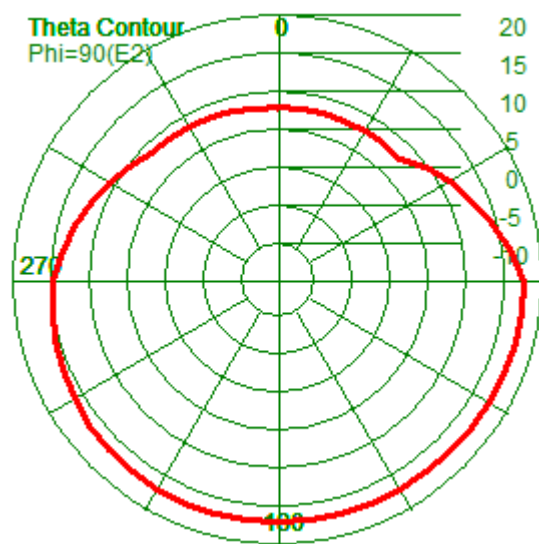
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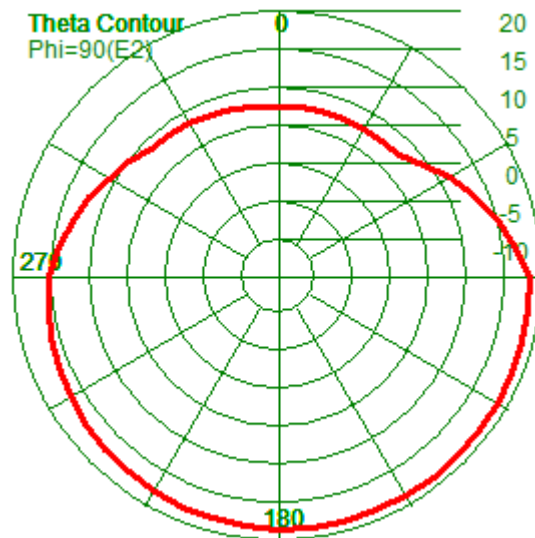
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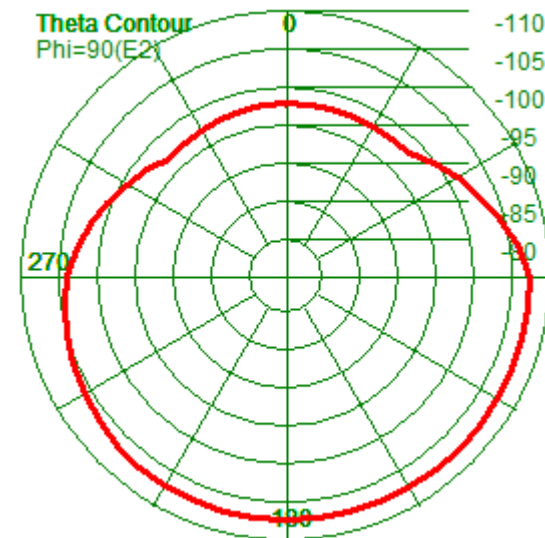
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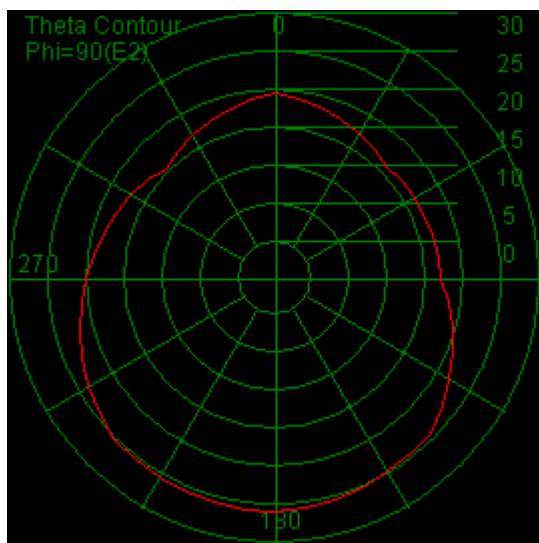
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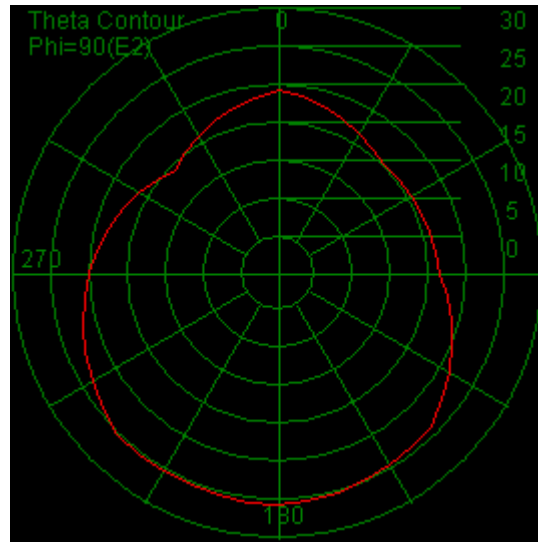
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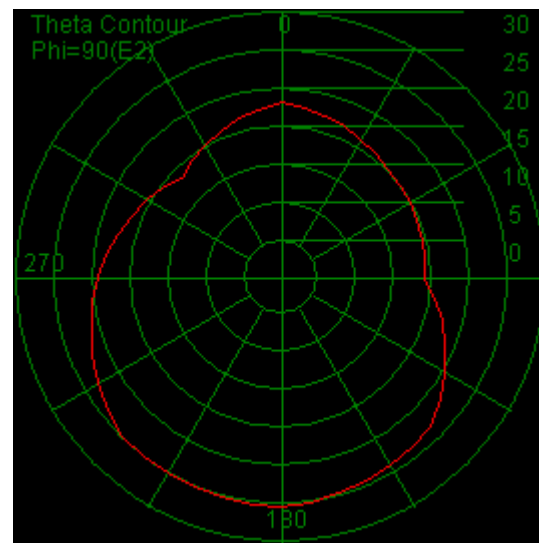
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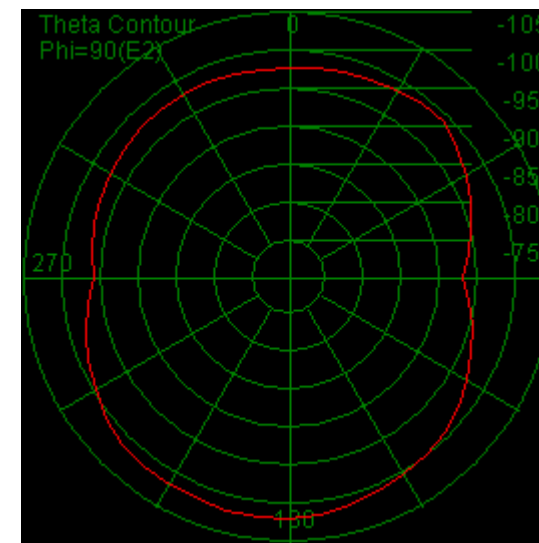
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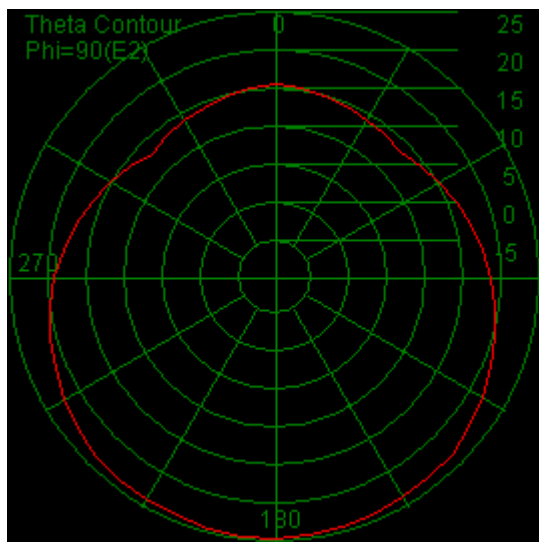
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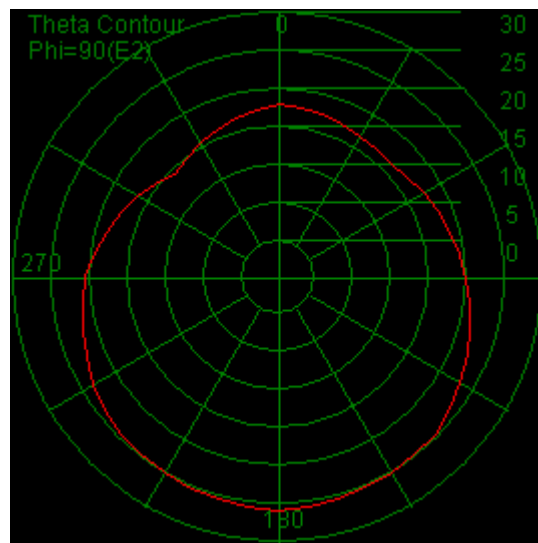
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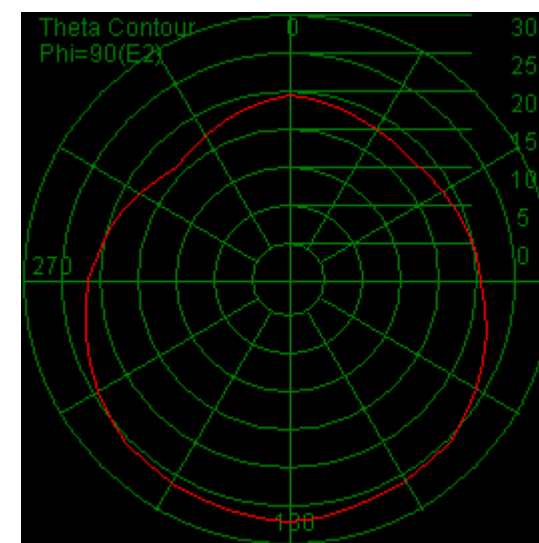
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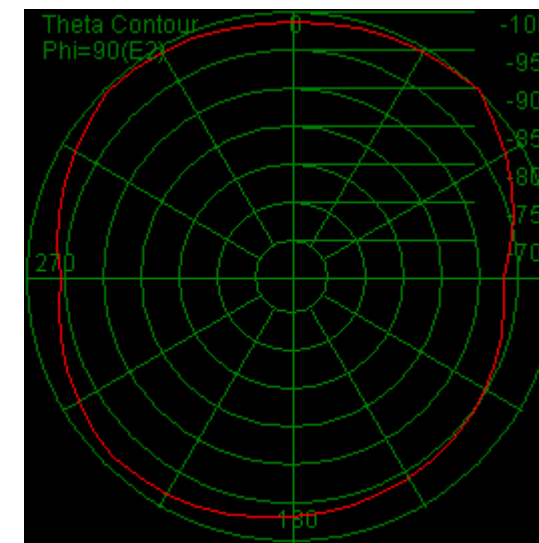
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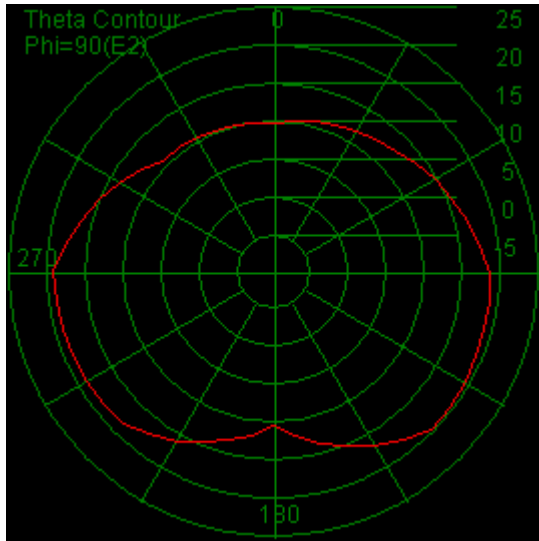
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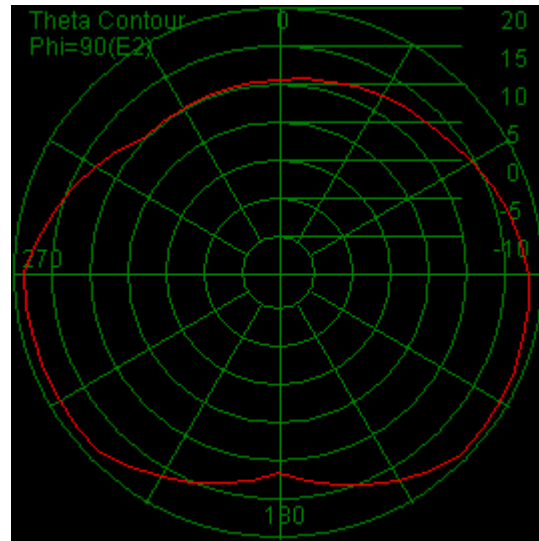
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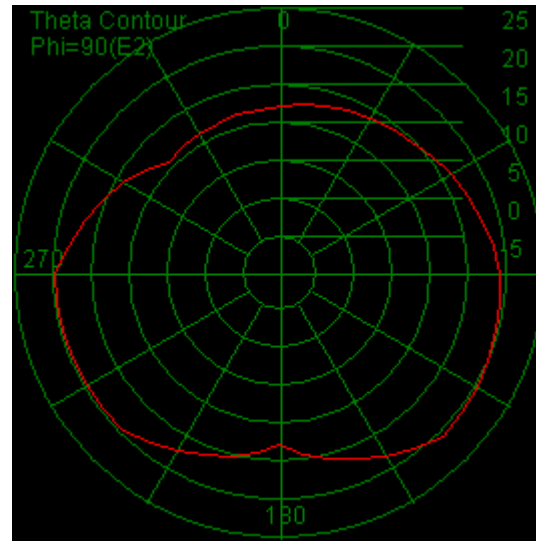
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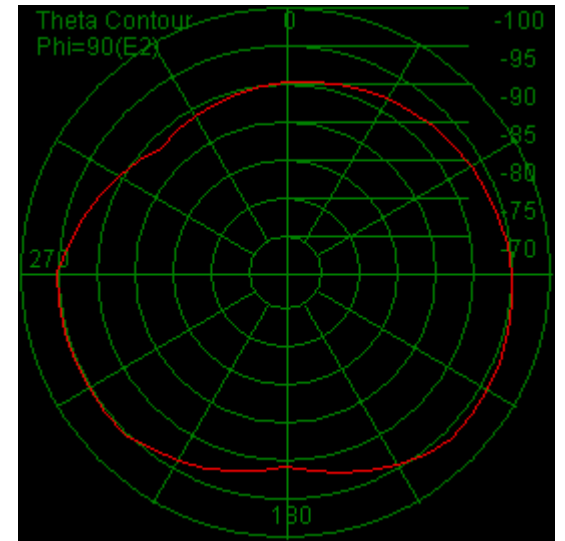
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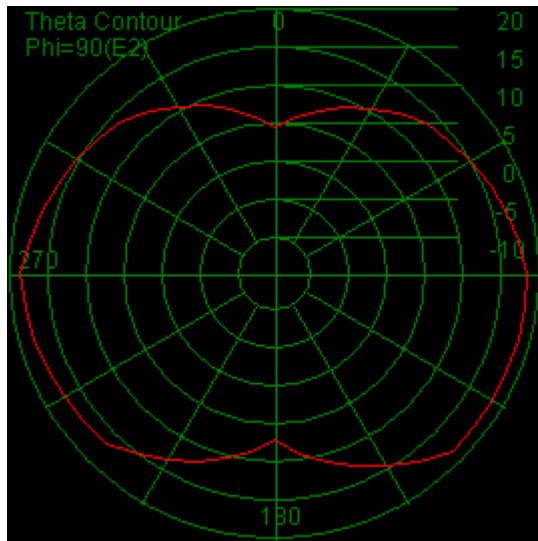
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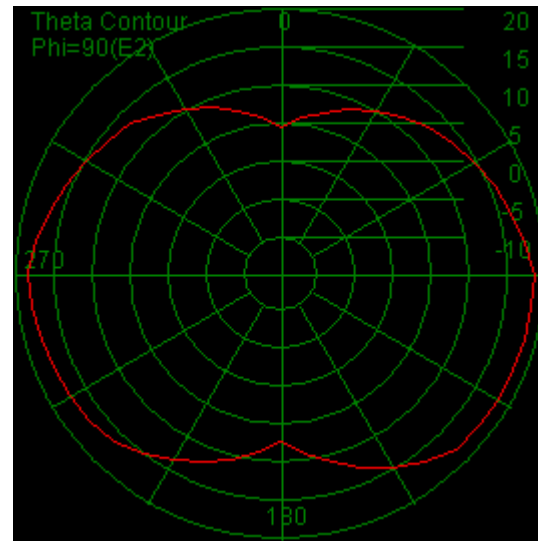
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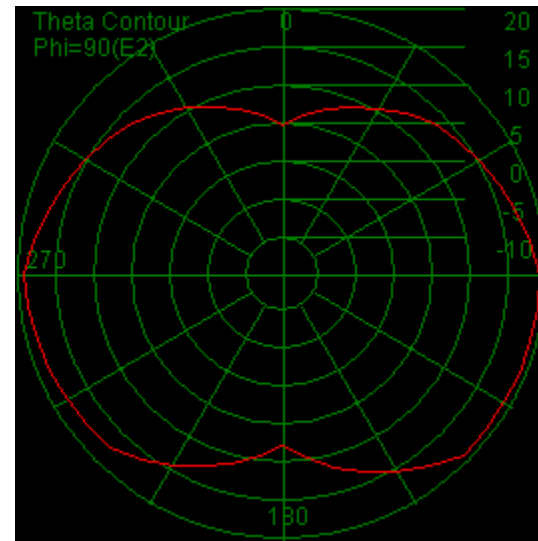
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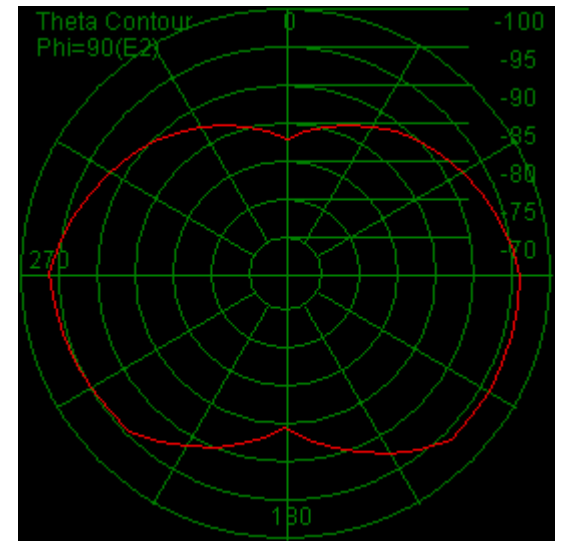
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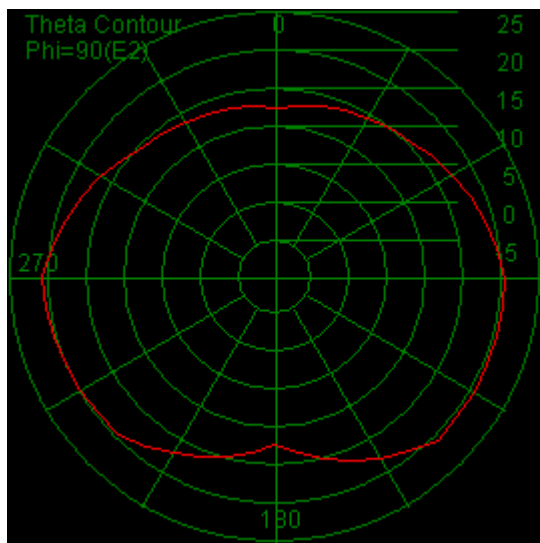
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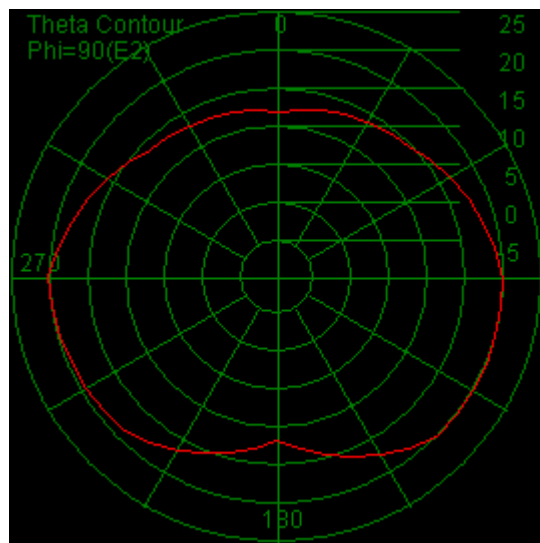
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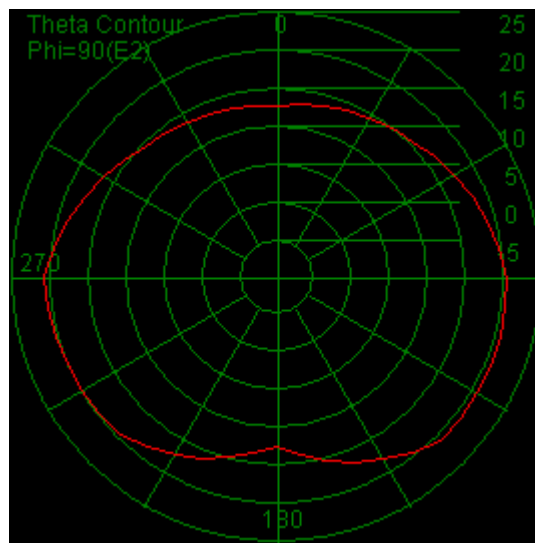
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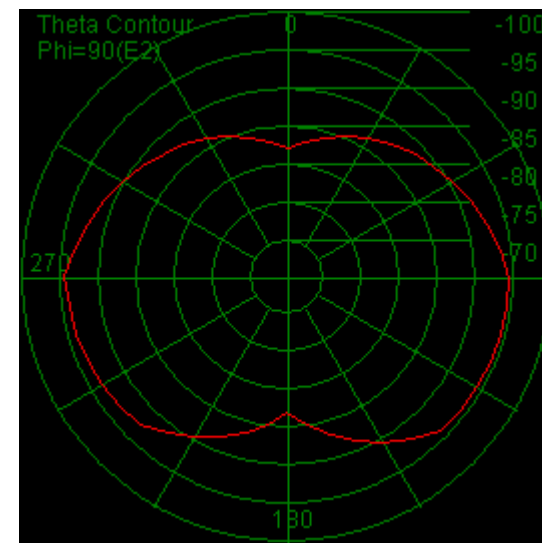
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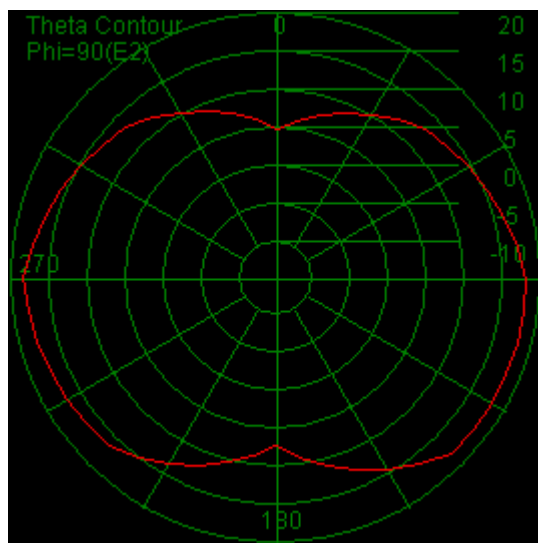
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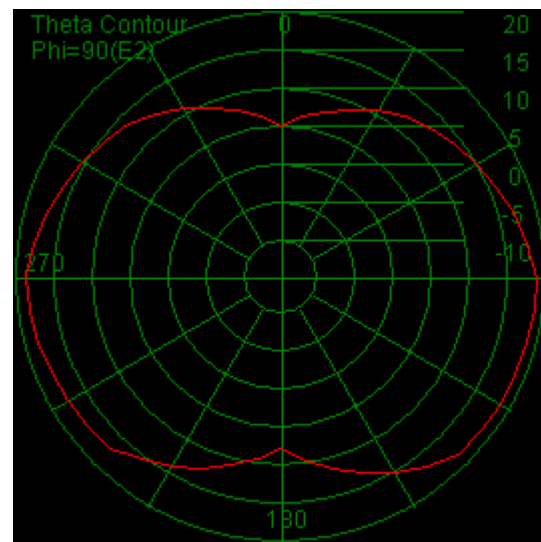
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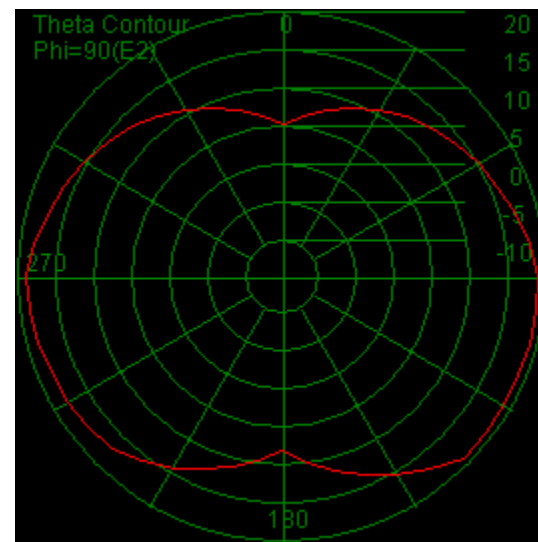
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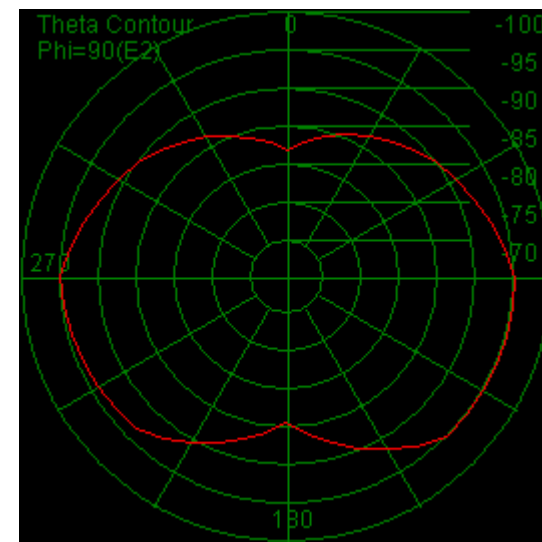
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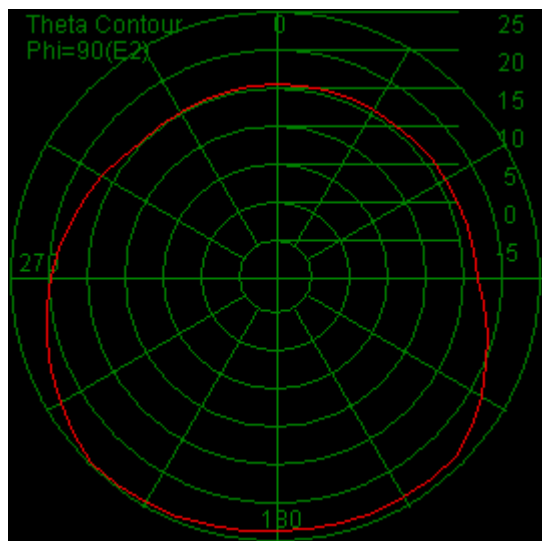
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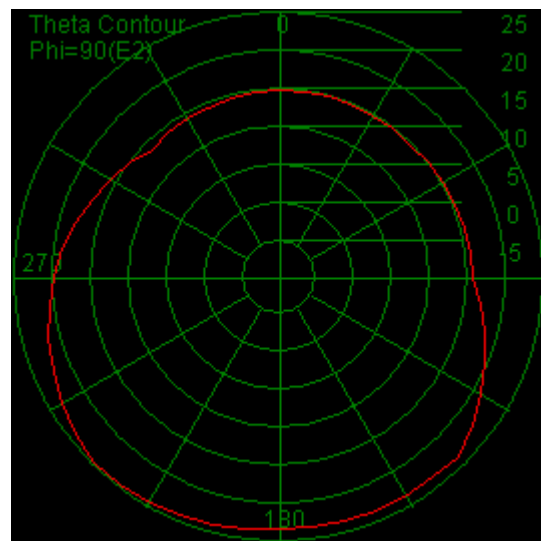
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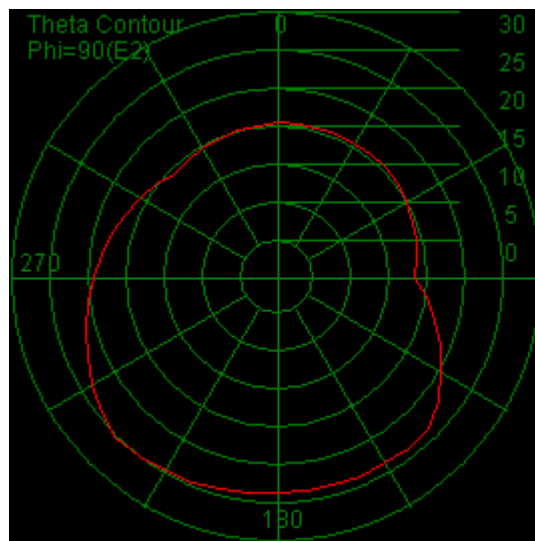
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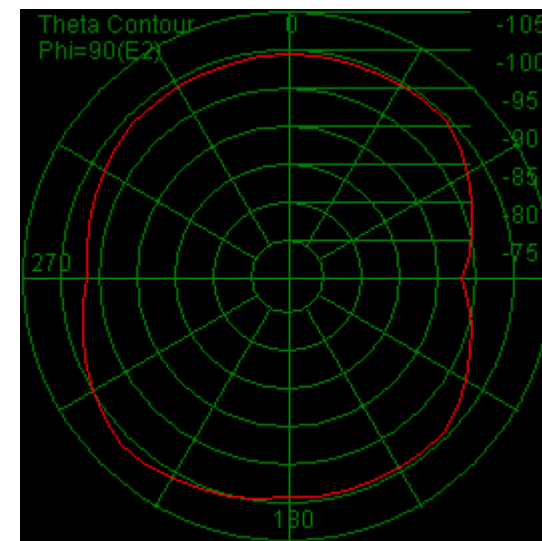
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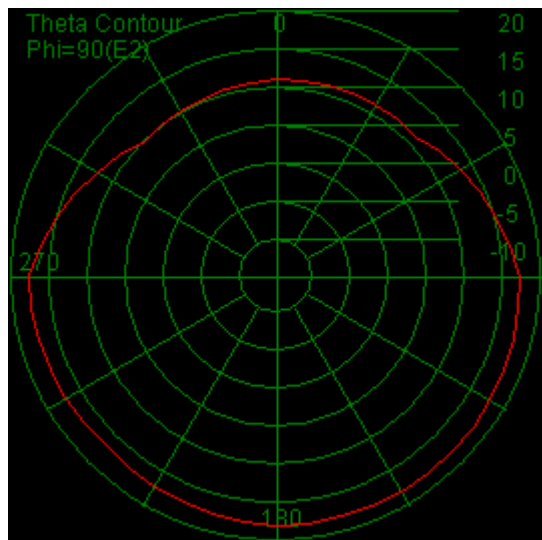
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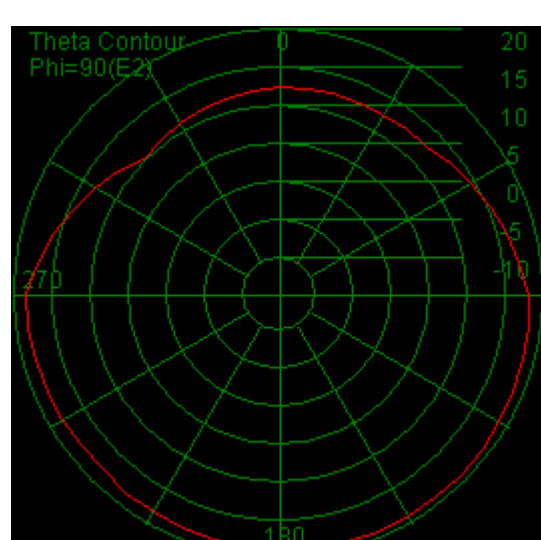
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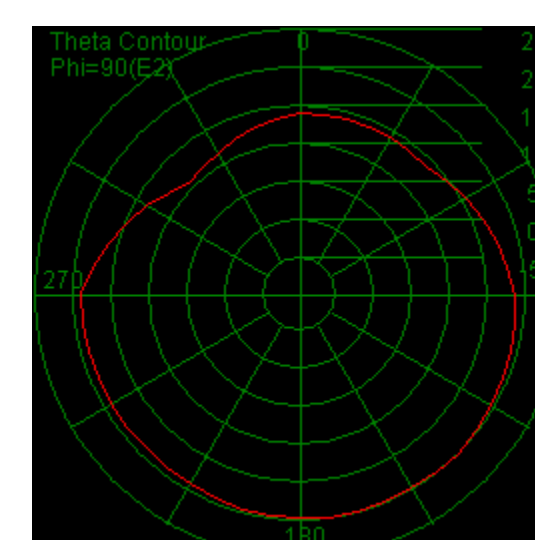
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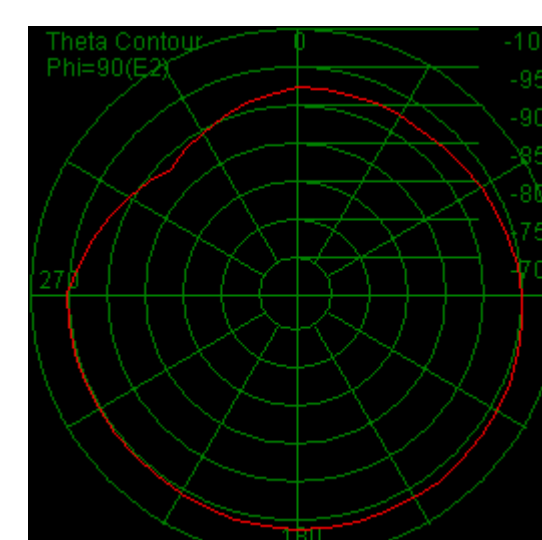
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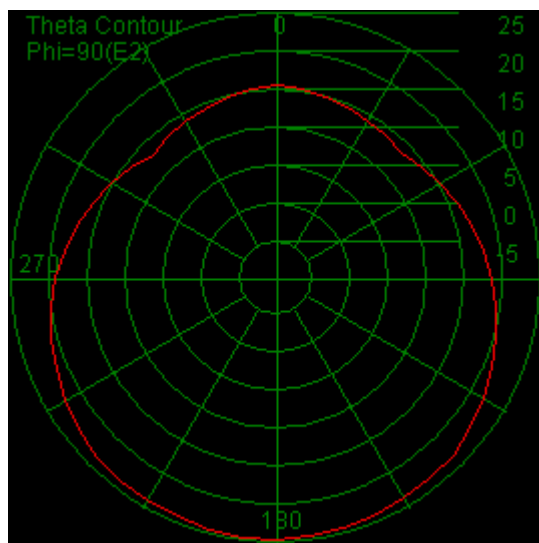
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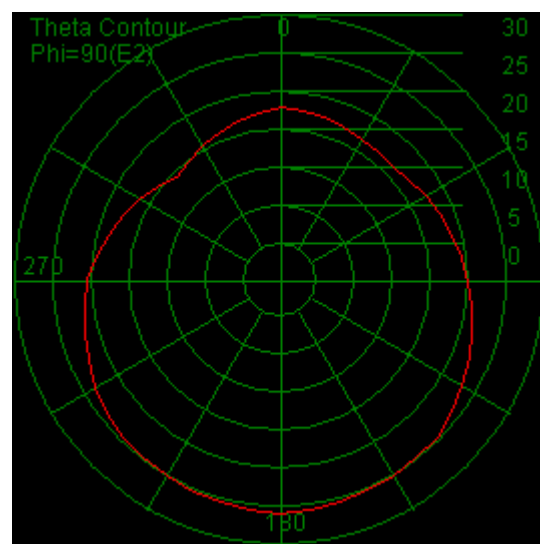
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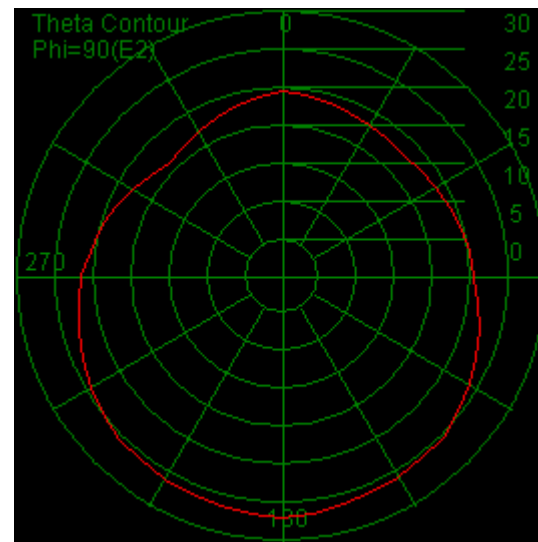
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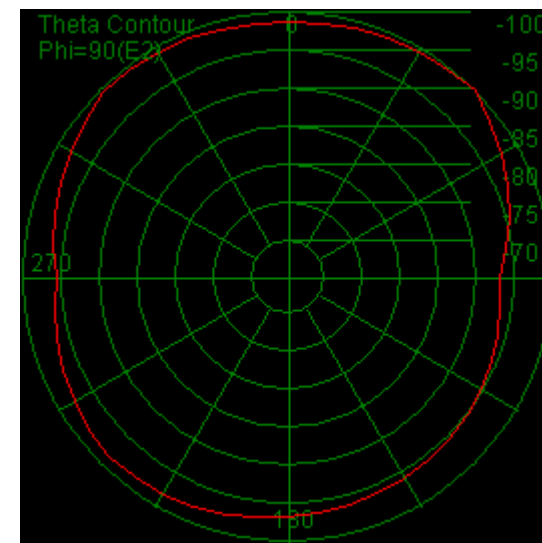
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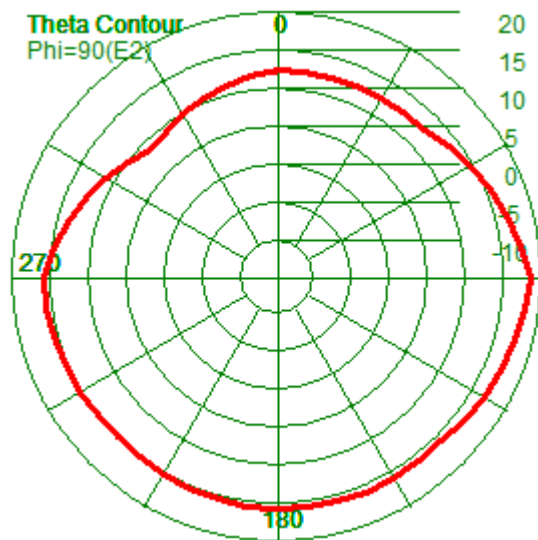
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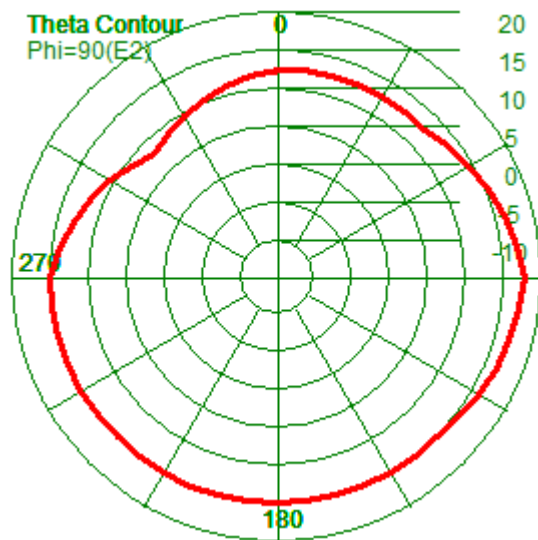
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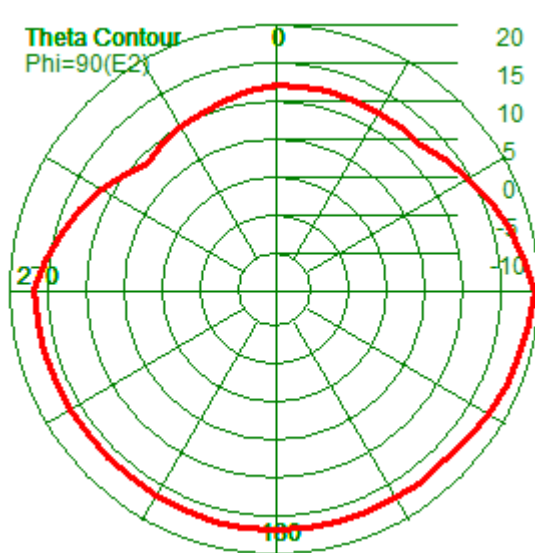
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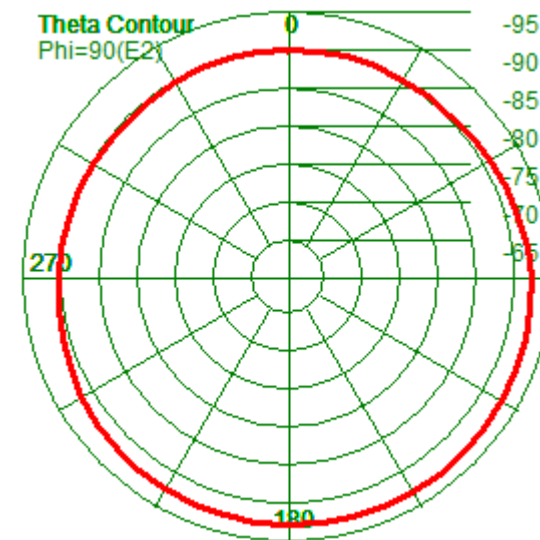
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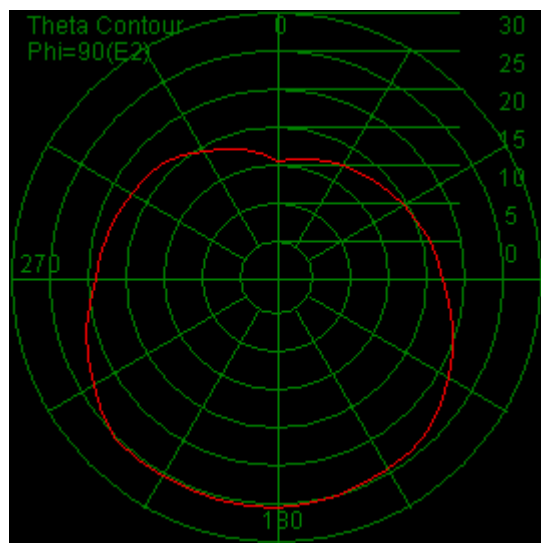
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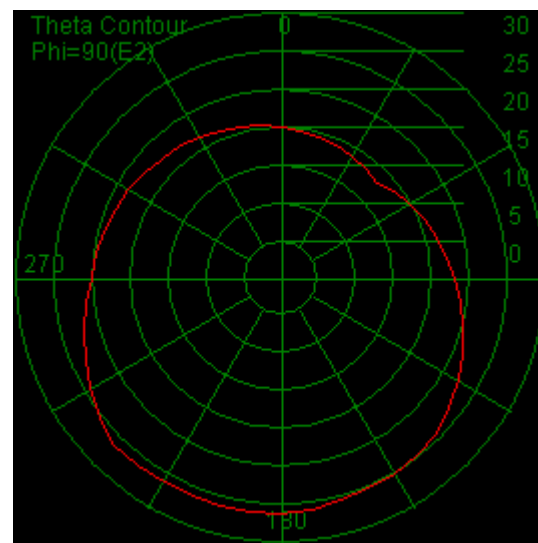
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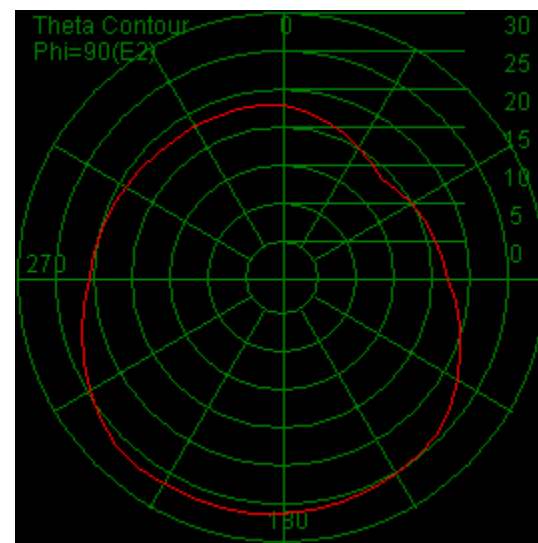
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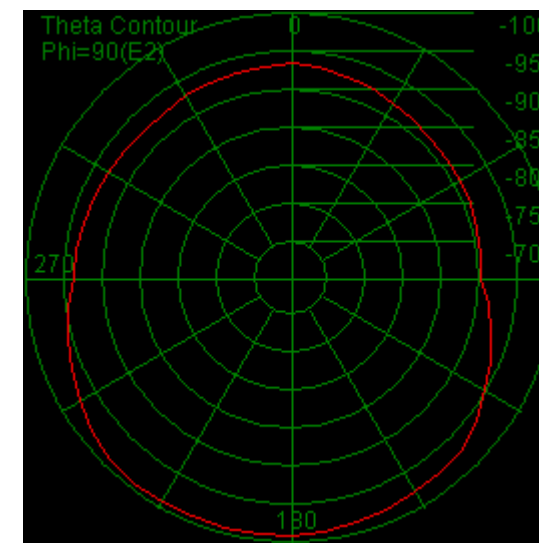
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LTE B41 41140 TRP E2

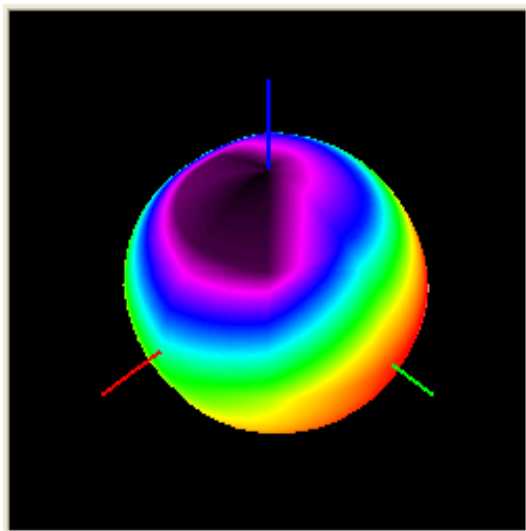


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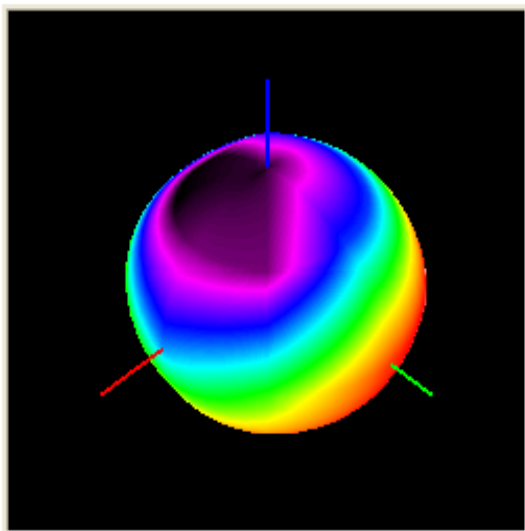


6.1 3D方向图

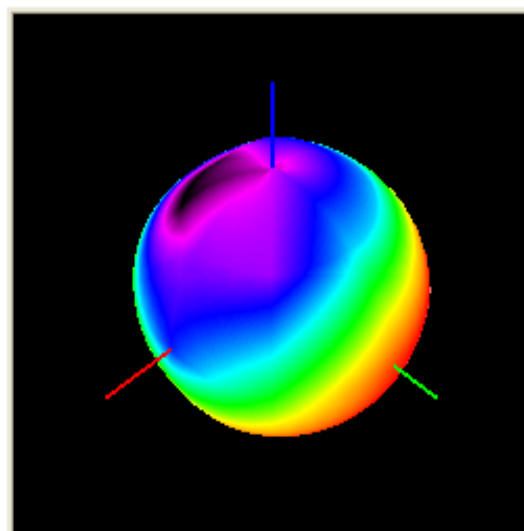
GSM850 128 TRP E2



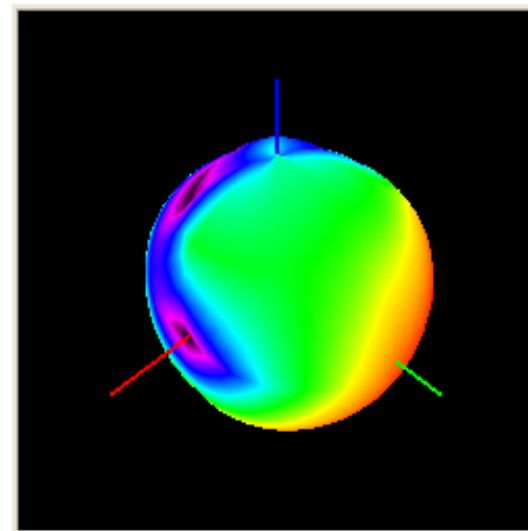
GSM850 192 TRP E2



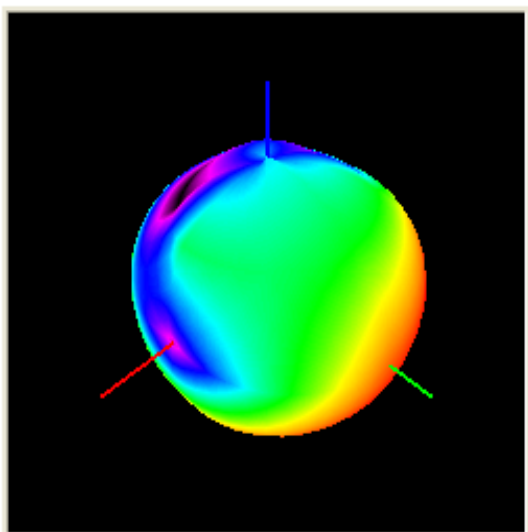
GSM850 251 TRP E2



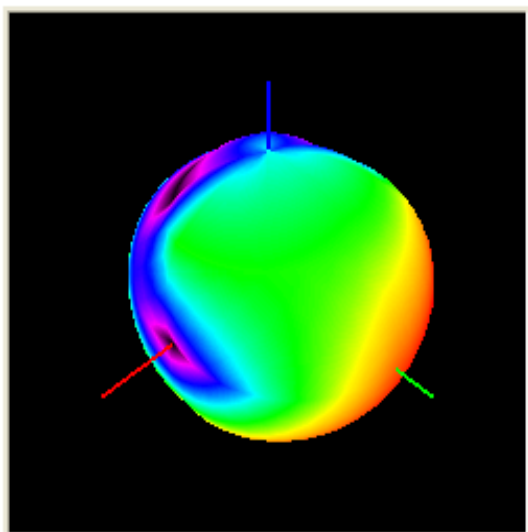
GSM850 251 TIS E2



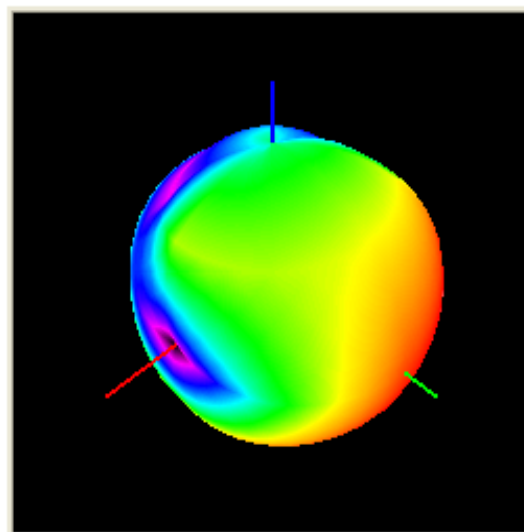
EGSM 1 TRP E2



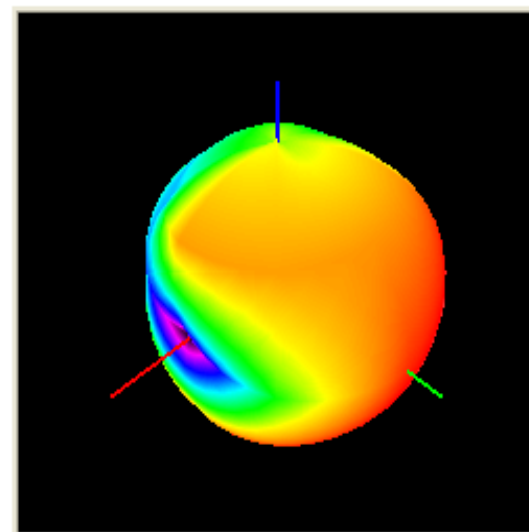
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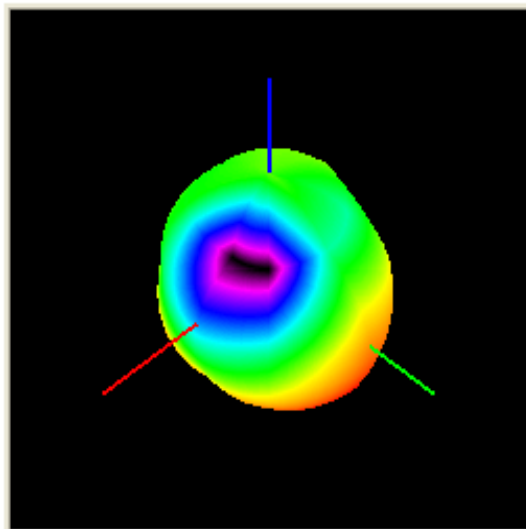
EGSM 124 TRP E2



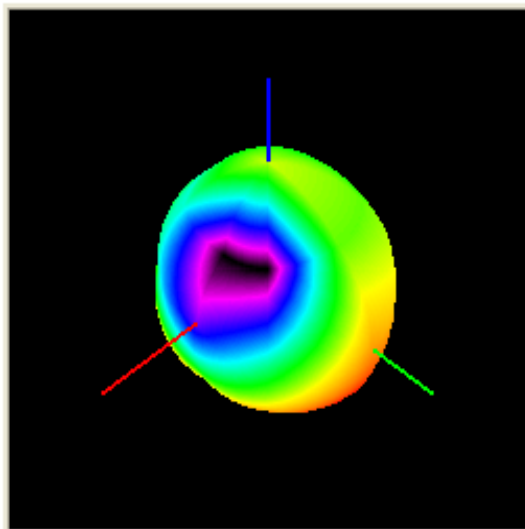
EGSM 124 TIS E2



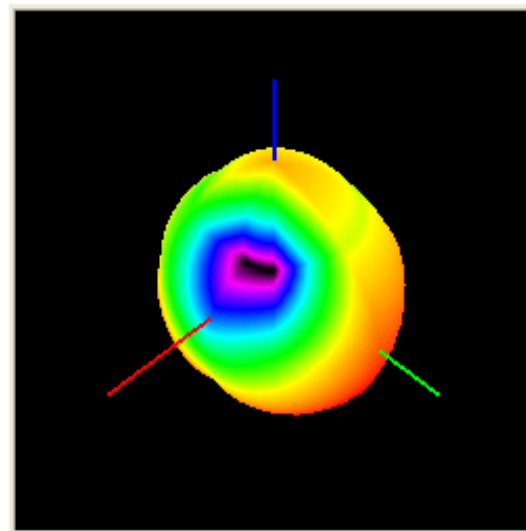
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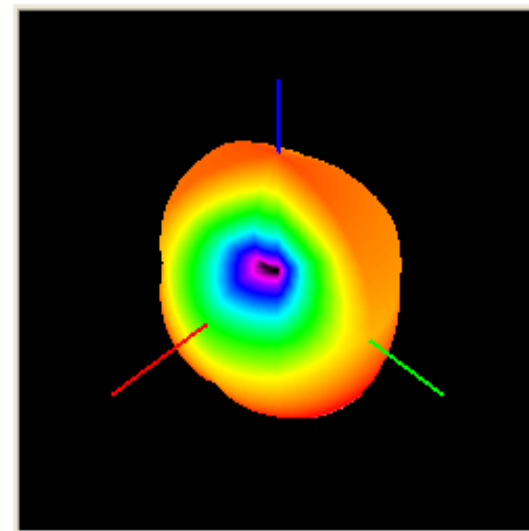
DCS 698 TRP E2



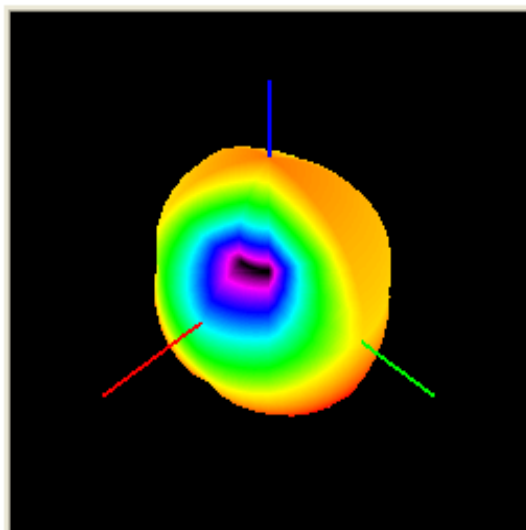
DCS 885 TRP E2



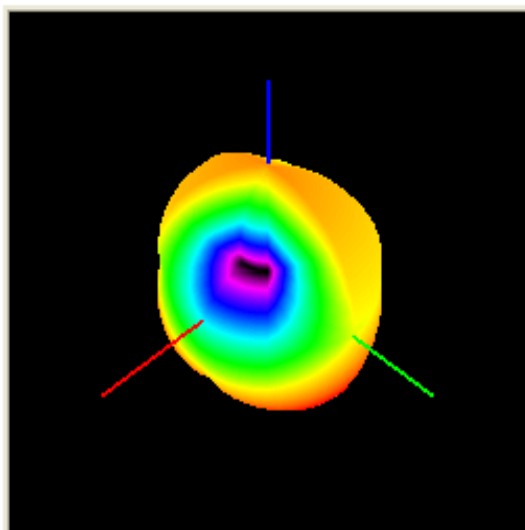
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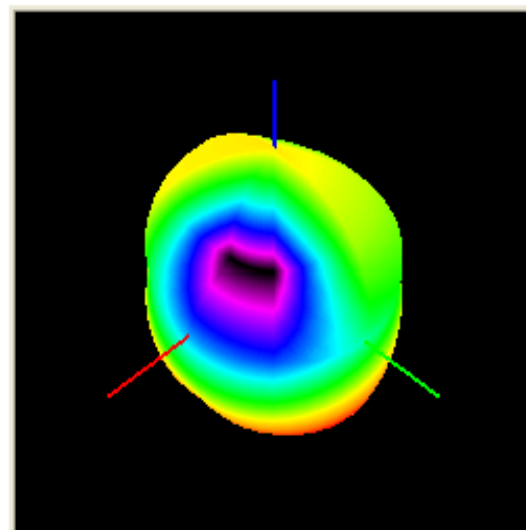
PCS 512 TRP E2



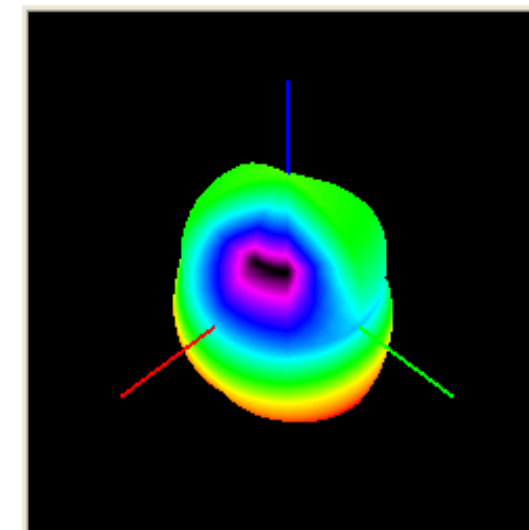
PCS 661 TRP E2



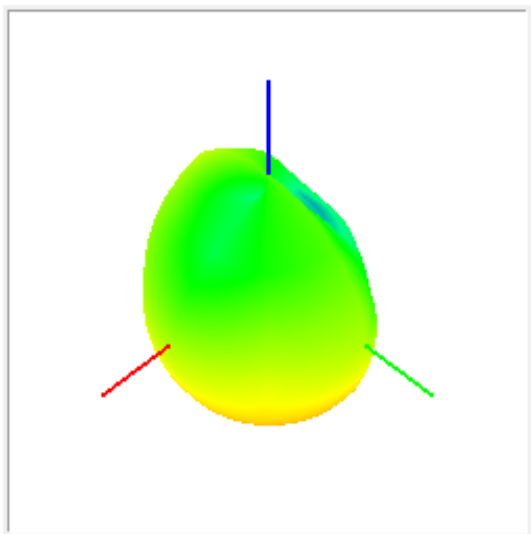
PCS 810 TRP E2



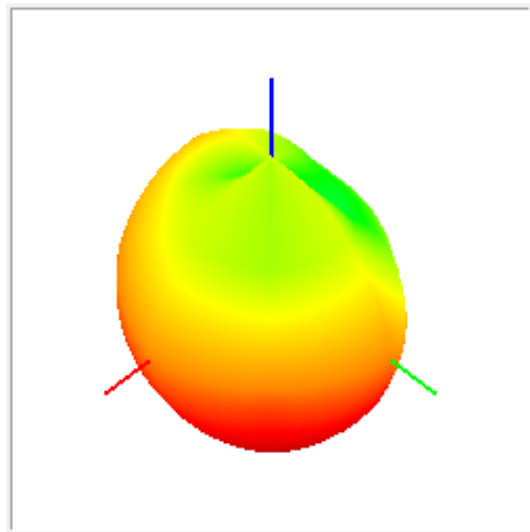
PCS 810 TIS E2



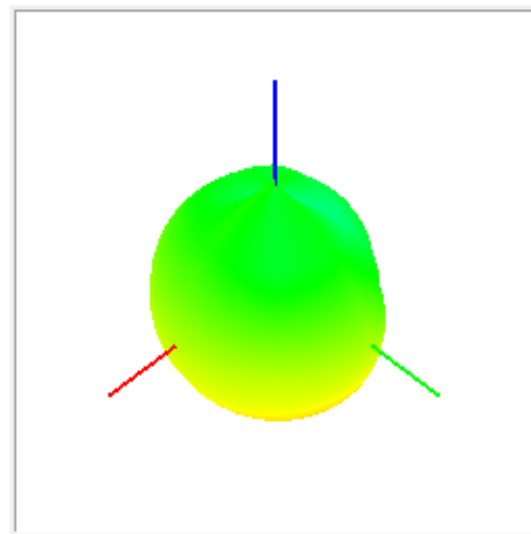
WCDMA B2 9262 TRP E2



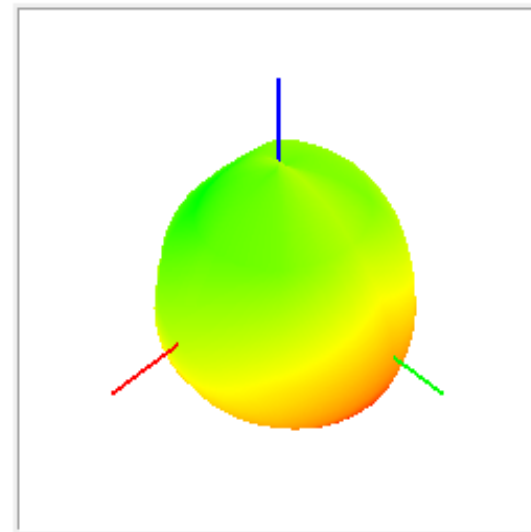
WCDMA B2 9400 TRP E2



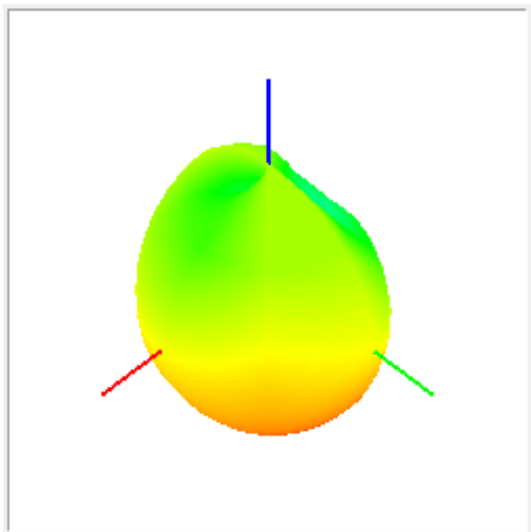
WCDMA B2 9538 TRP E2



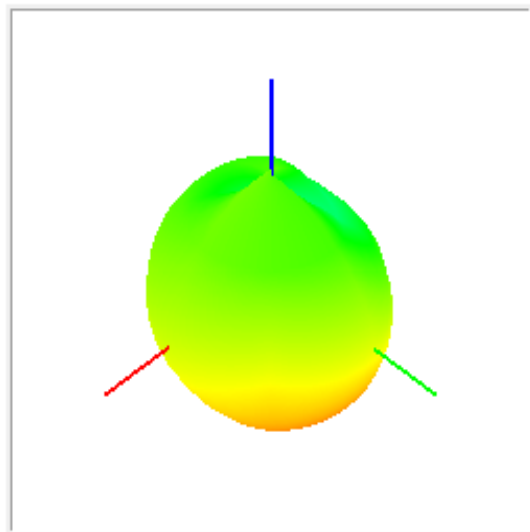
WCDMA B2 9938 TIS E2



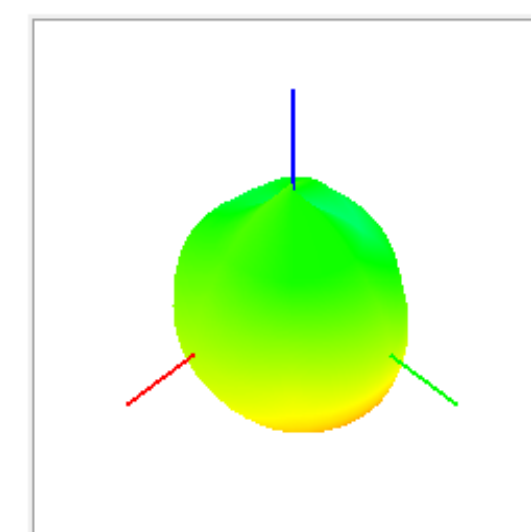
WCDMA B4 1312 TRP E2



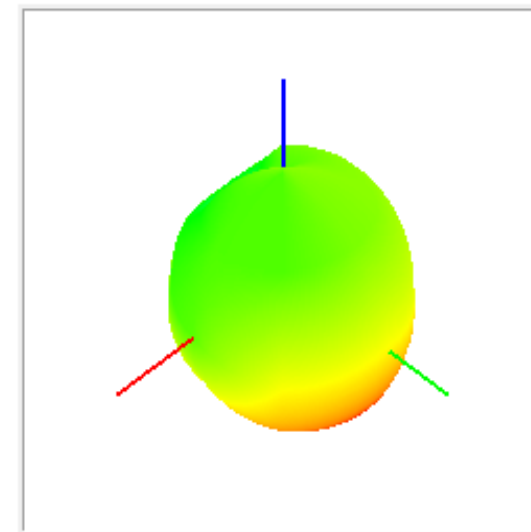
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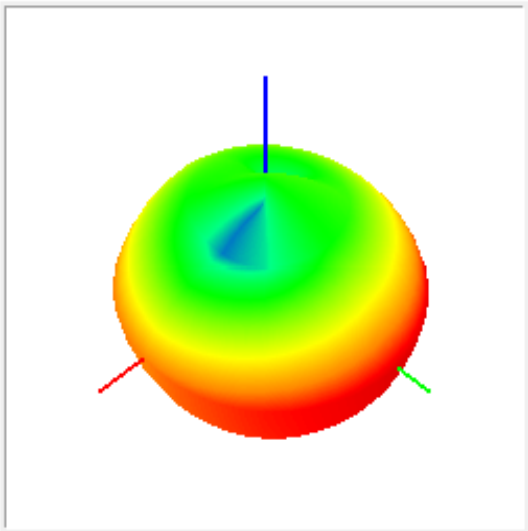
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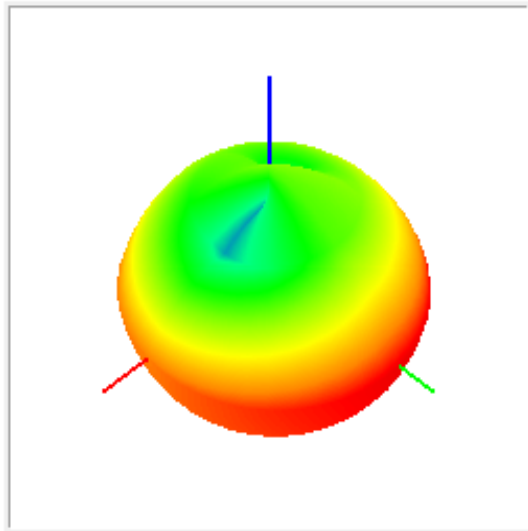
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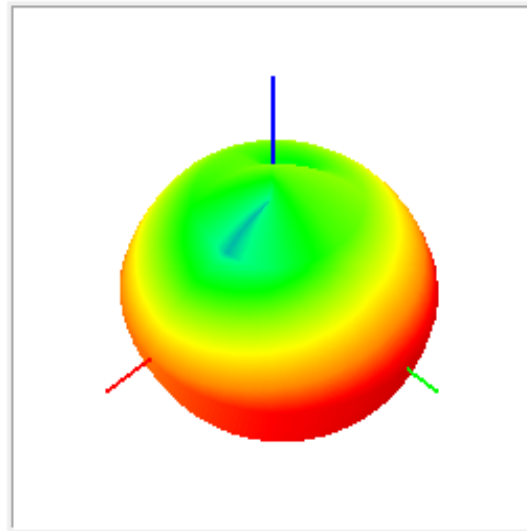
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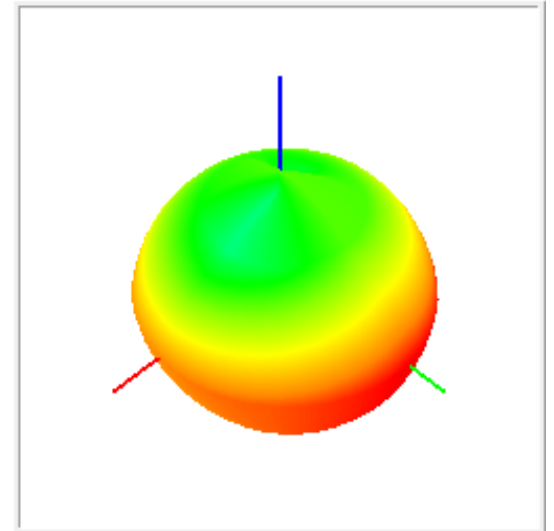
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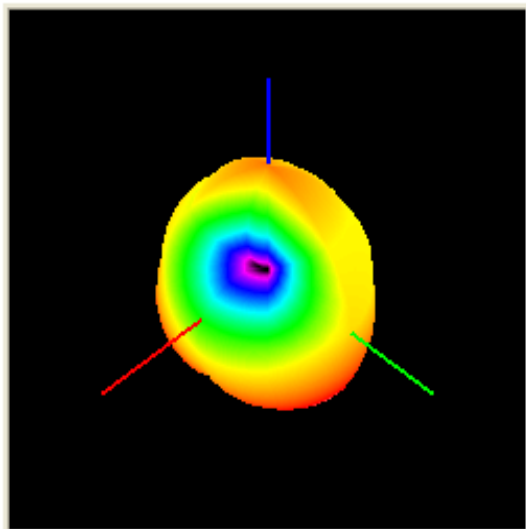
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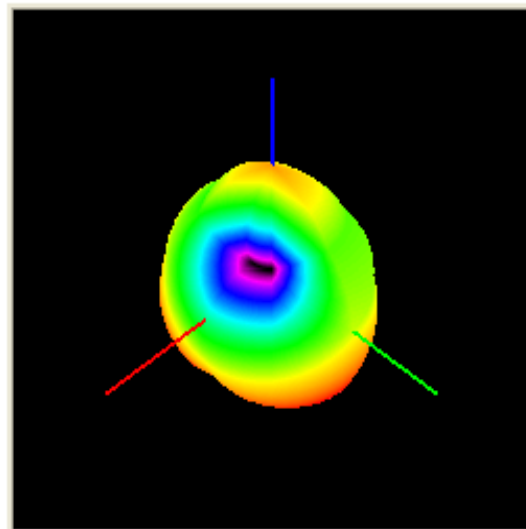
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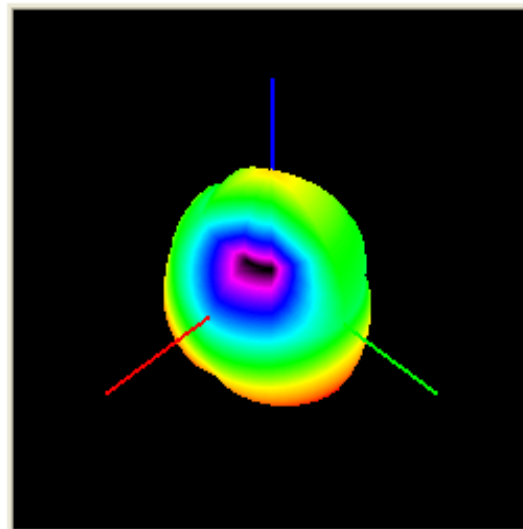
LTE B2 18650 TRP E2



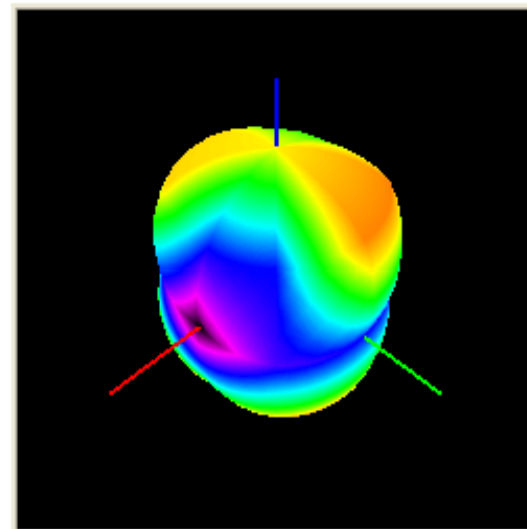
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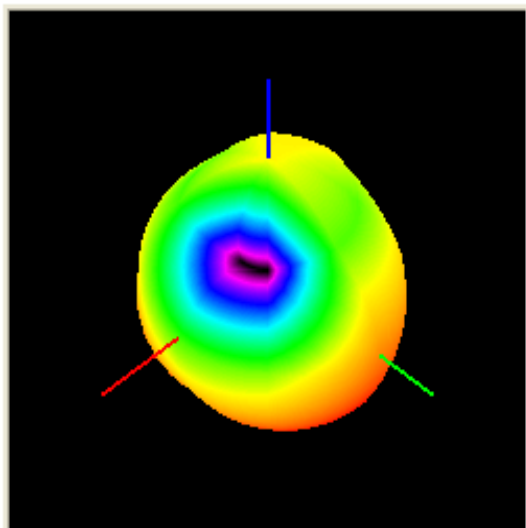
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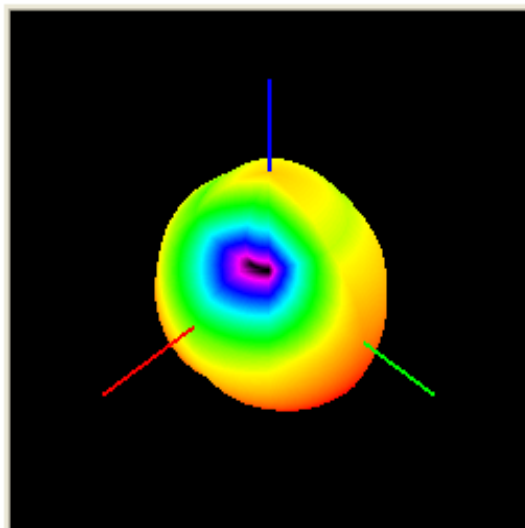
LTE B2 1150 TIS E2



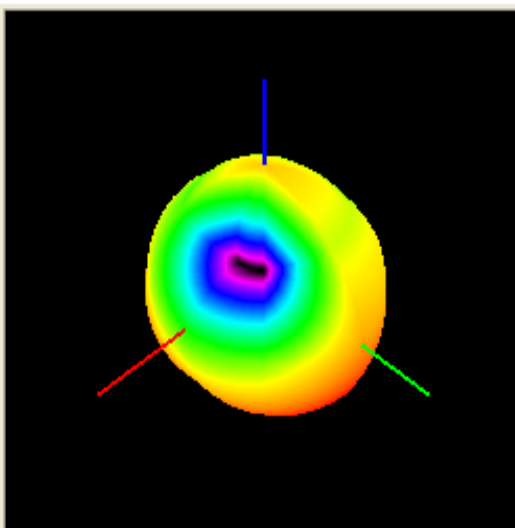
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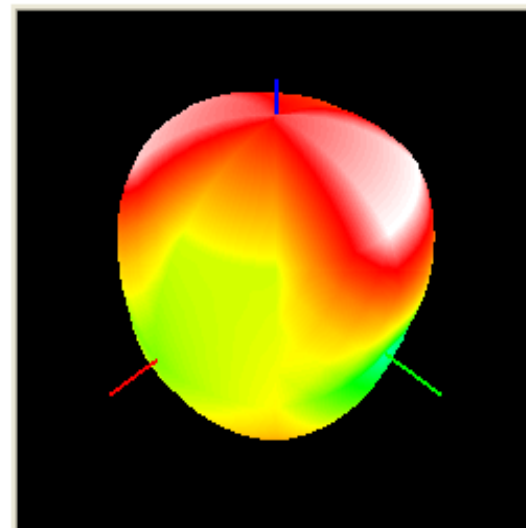
LTE B4 20175 TRP E2



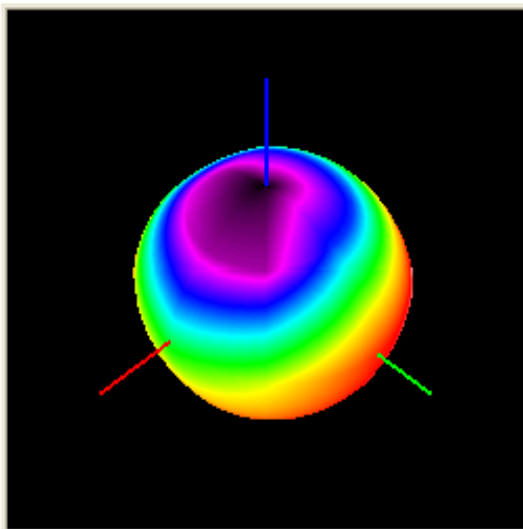
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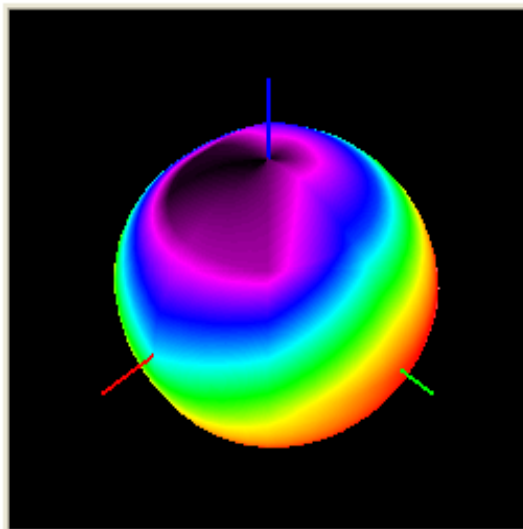
LTE B4 2350 TIS E2



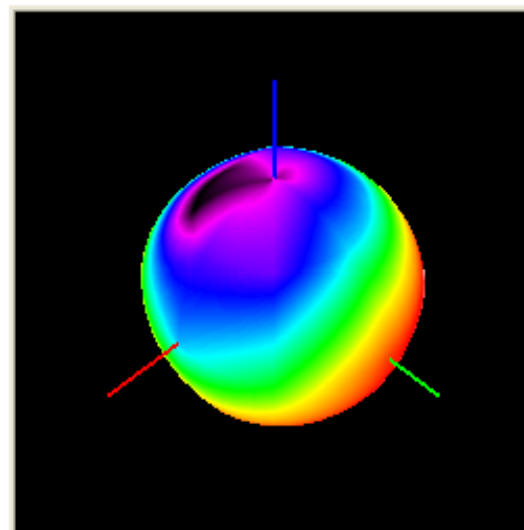
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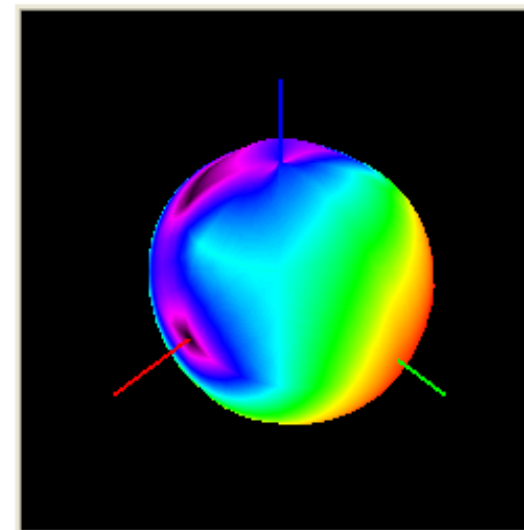
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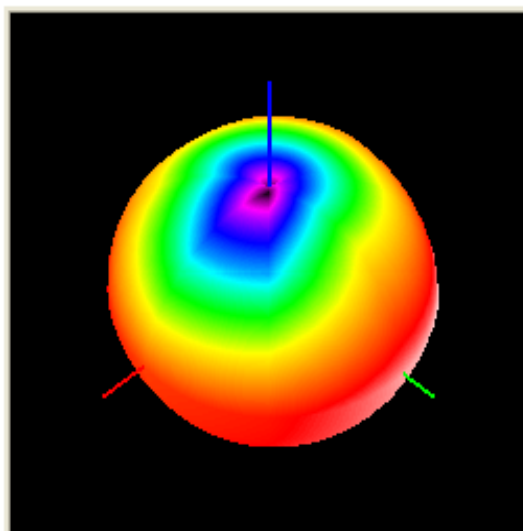
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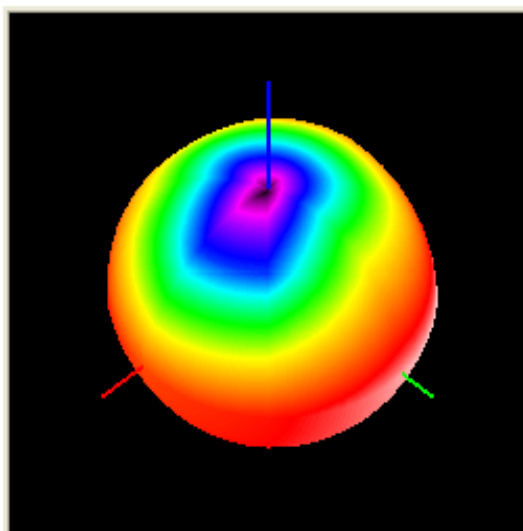
LTE B5 2600 TIS E2



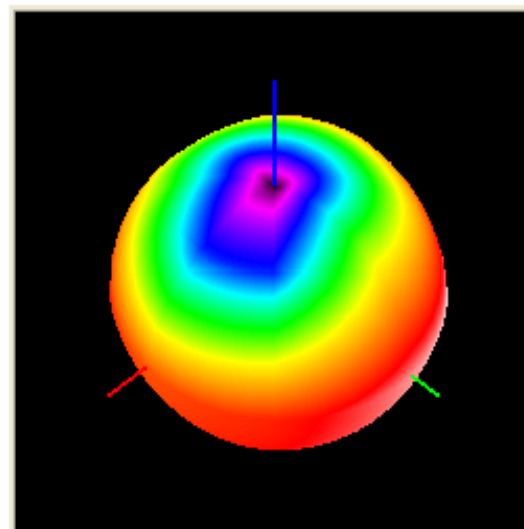
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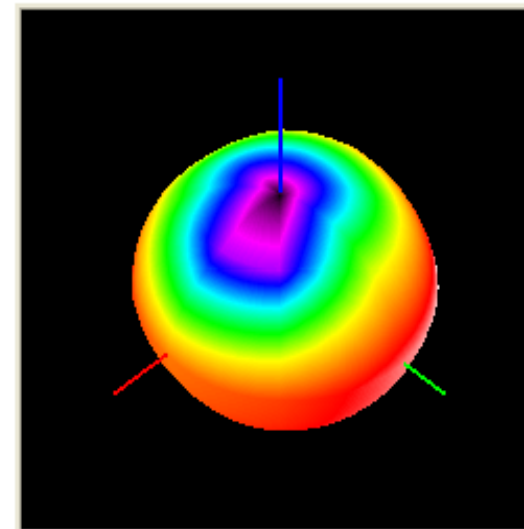
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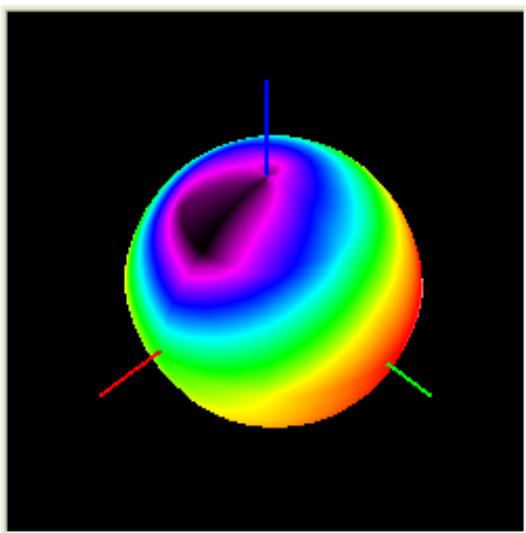
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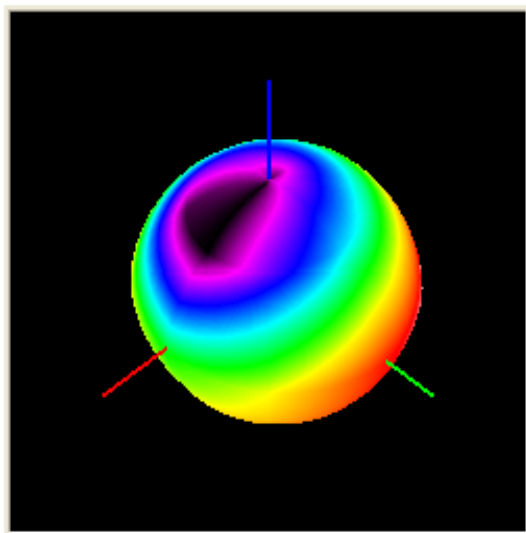
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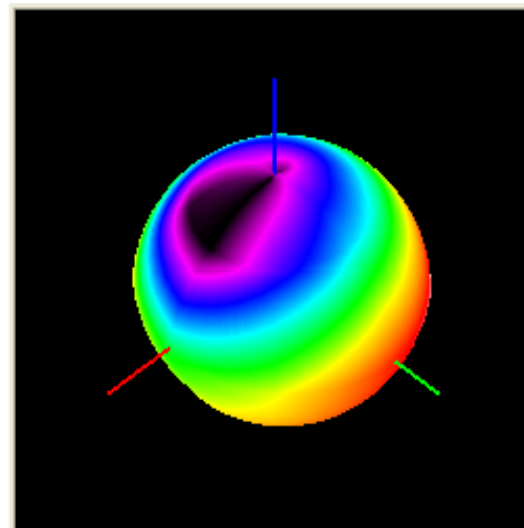
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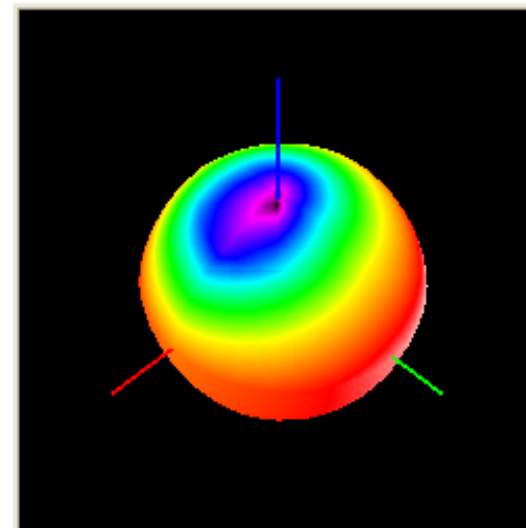
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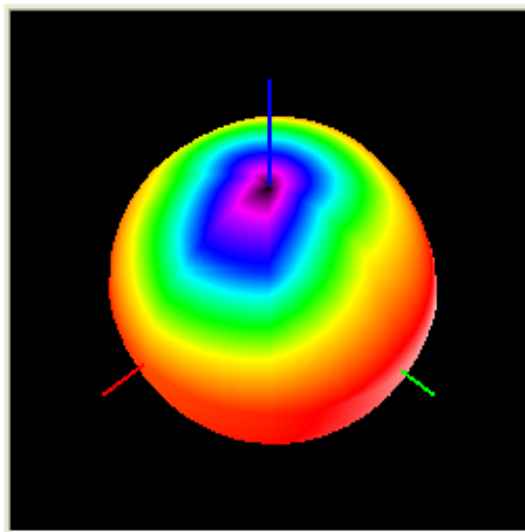
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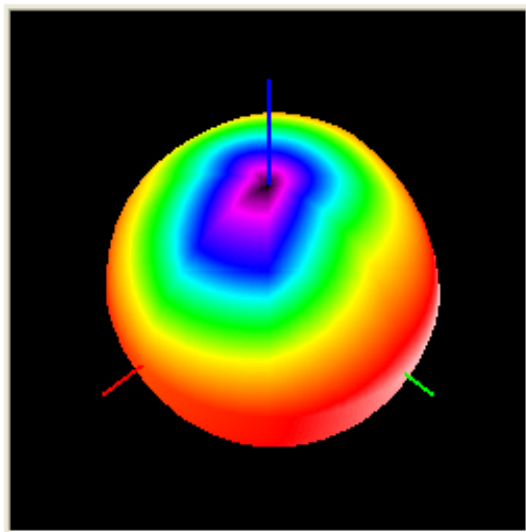
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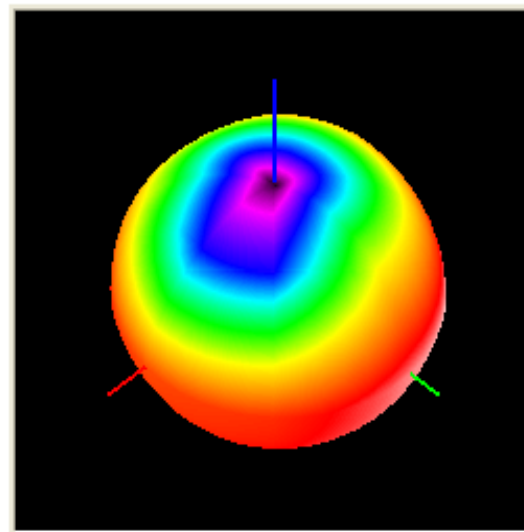
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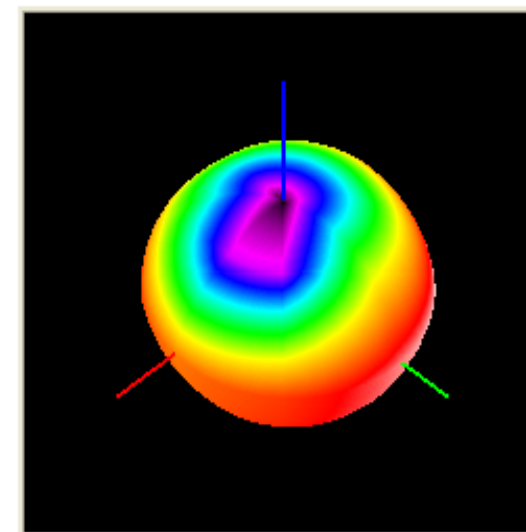
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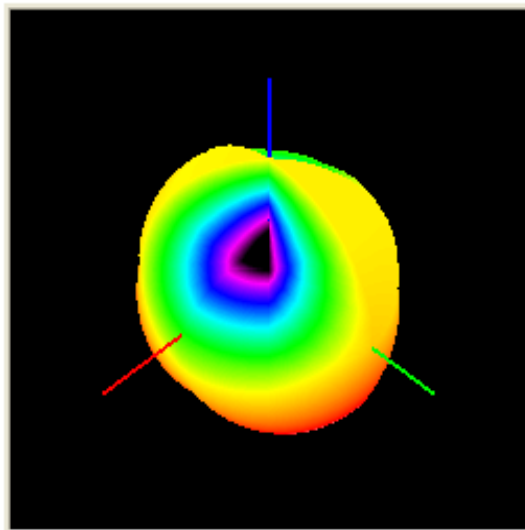
LTE B17 23800 TRP E2



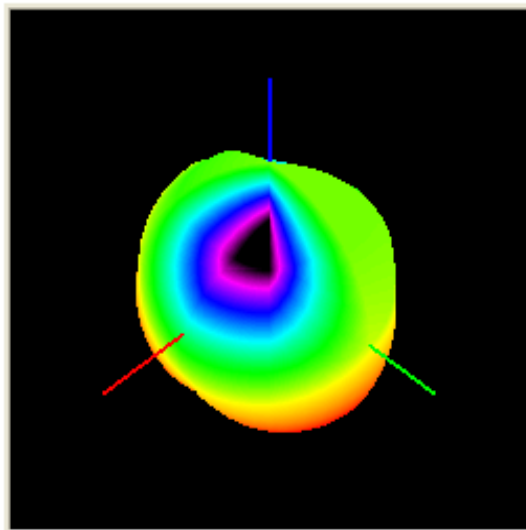
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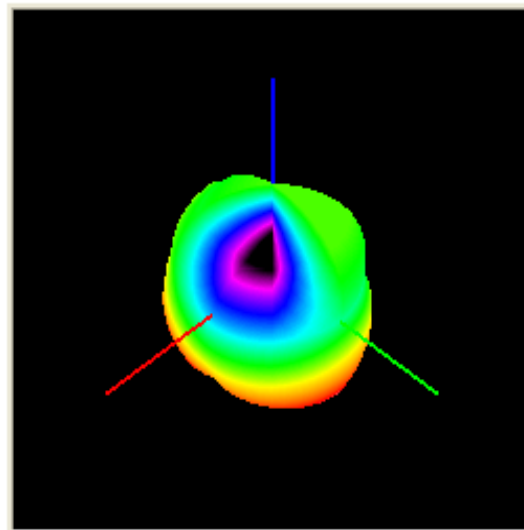
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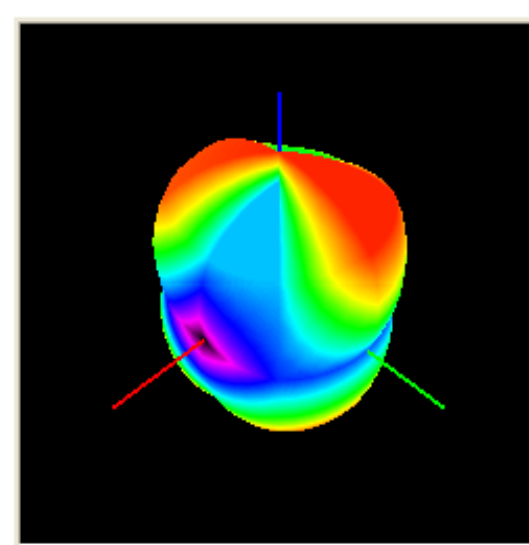
LTE B25 26365 TRP E2



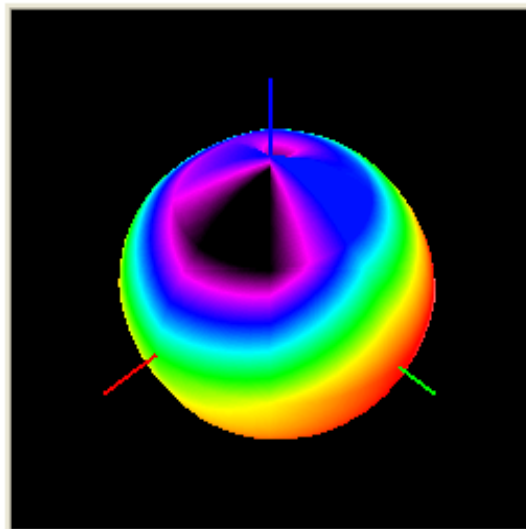
LTE B25 26665 TRP E2



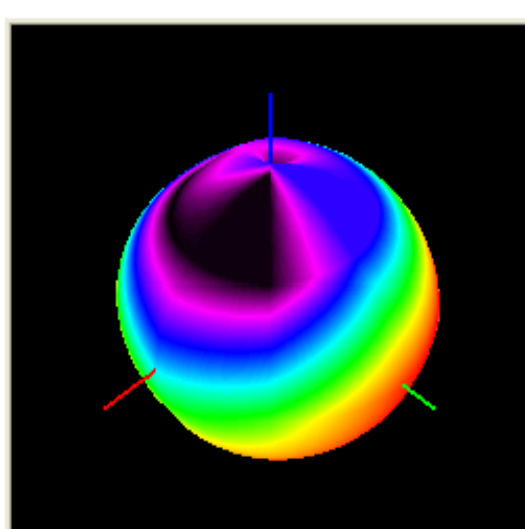
LTE B25 8665 TIS E2



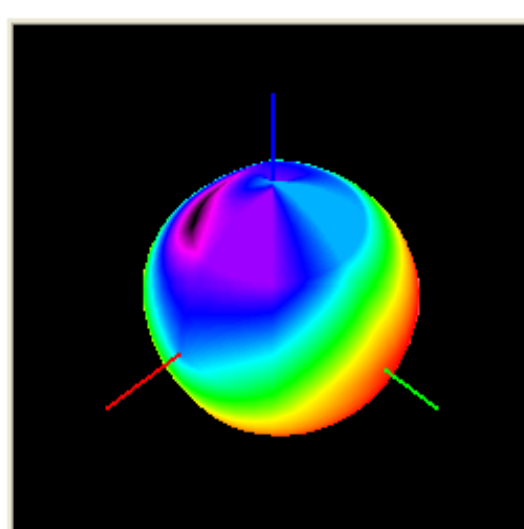
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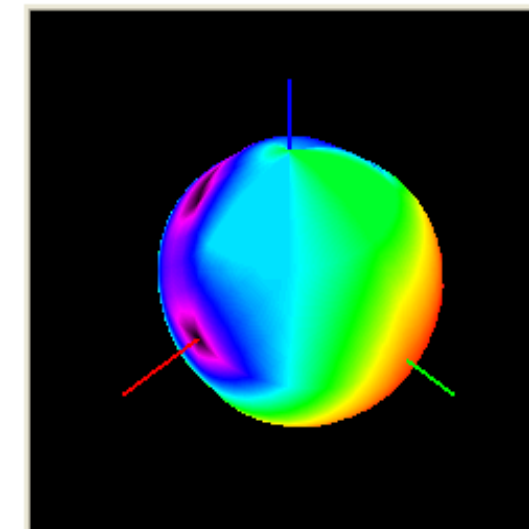
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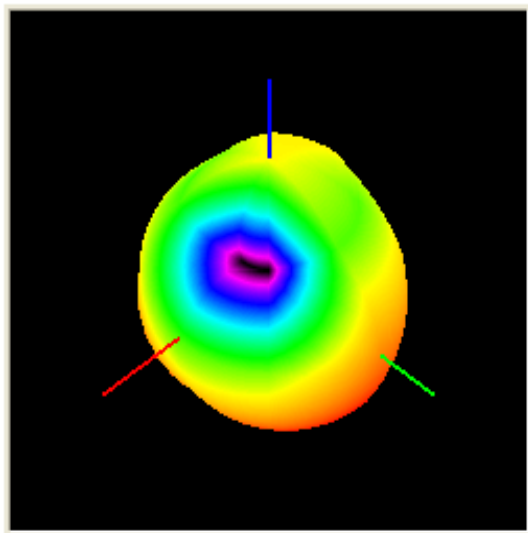
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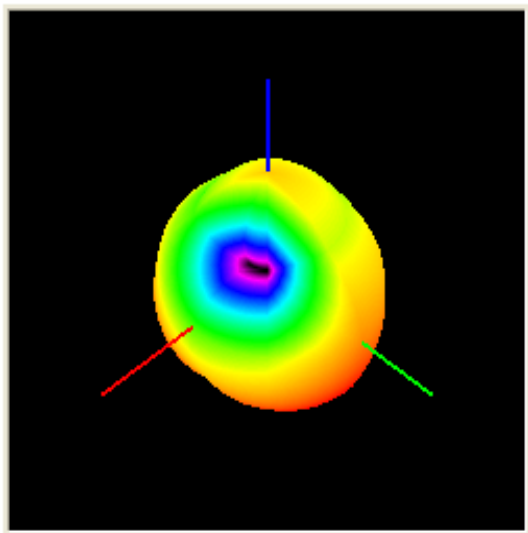
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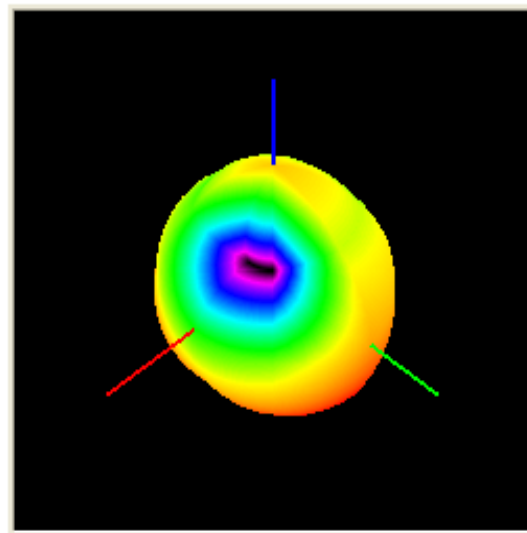
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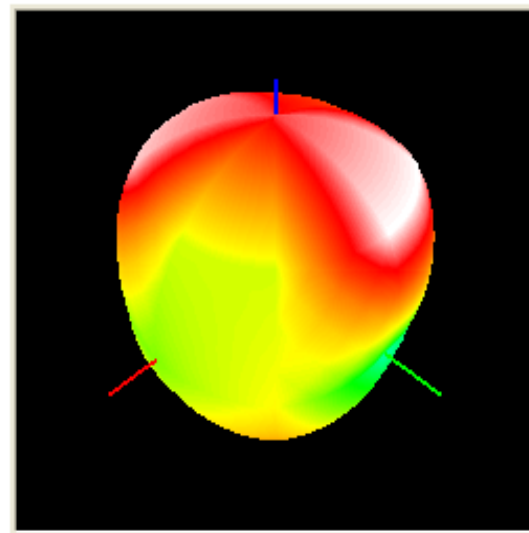
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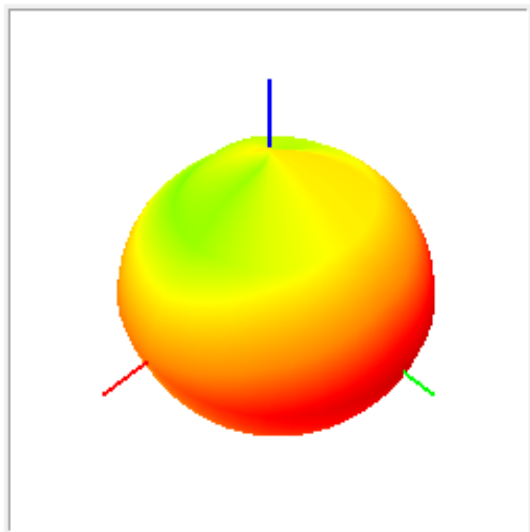
LTE B66 132622 TRP E2



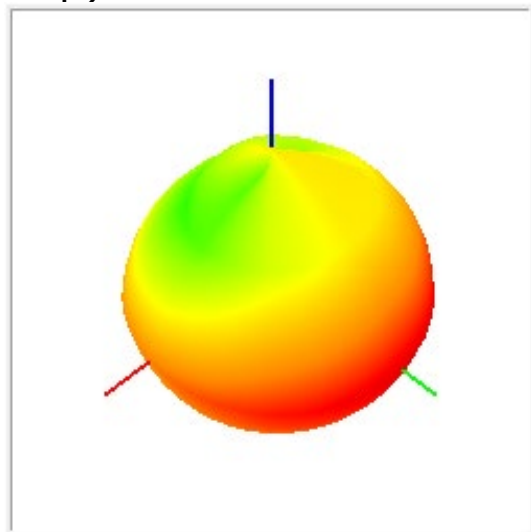
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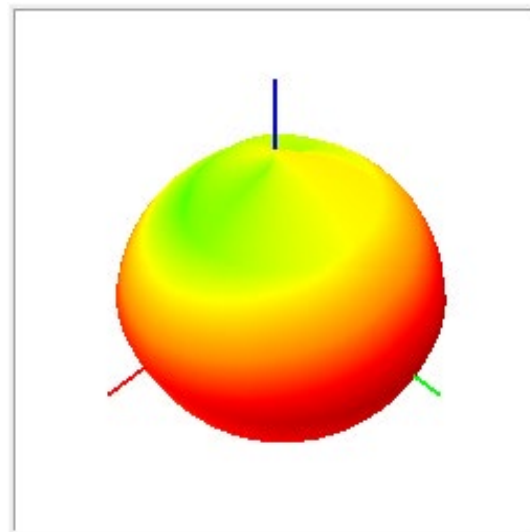
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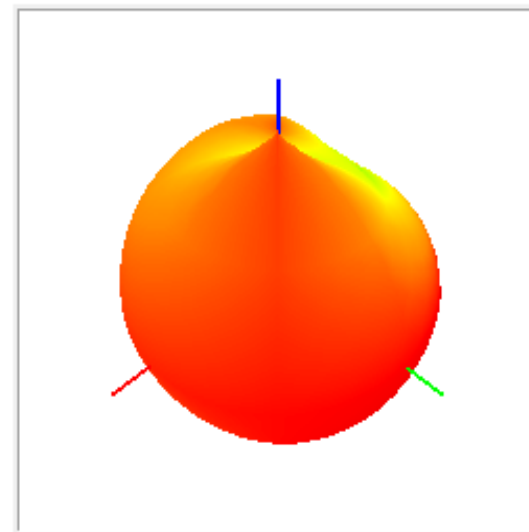
LTE B71 133297 TRP
E2



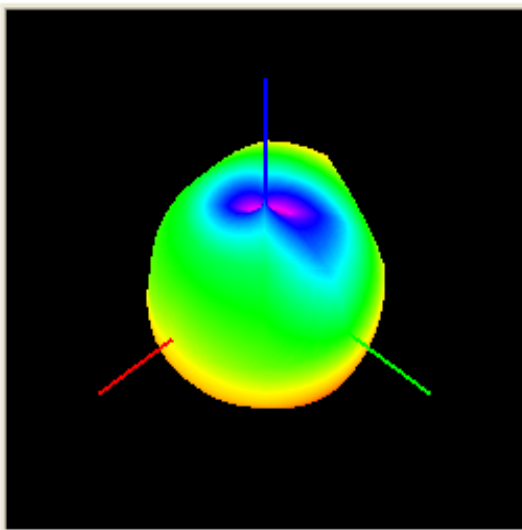
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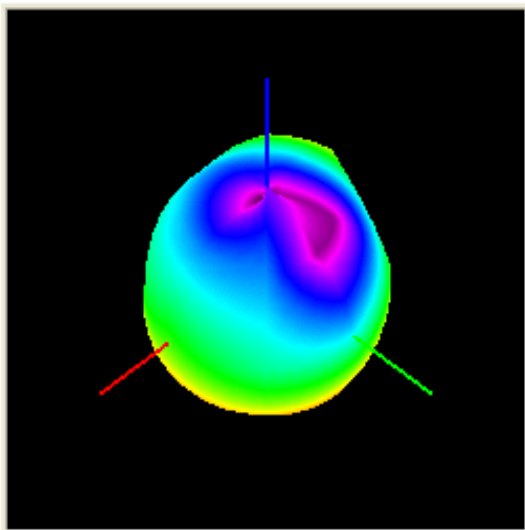
LTE B71 68836 TRP E2



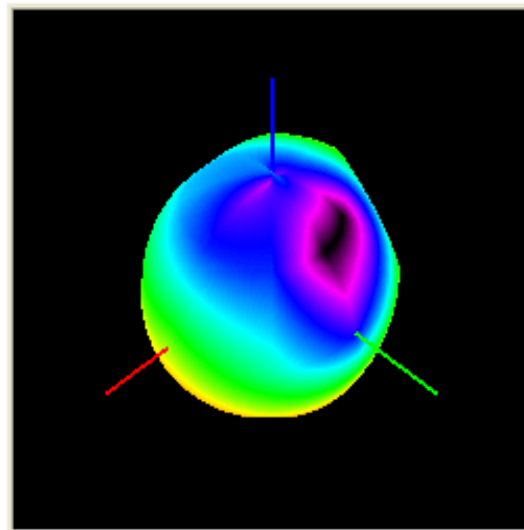
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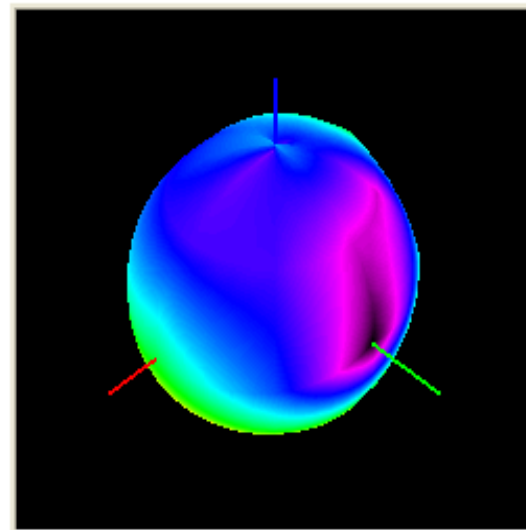
LTE B41 40620 TRP E2



LTE B41 41140 TRP E2



LTE B41 41140 TIS E2



7.1 主天线增益

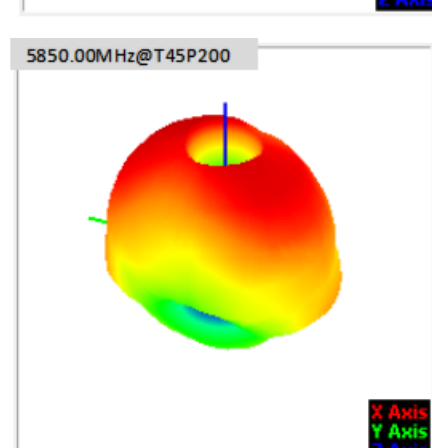
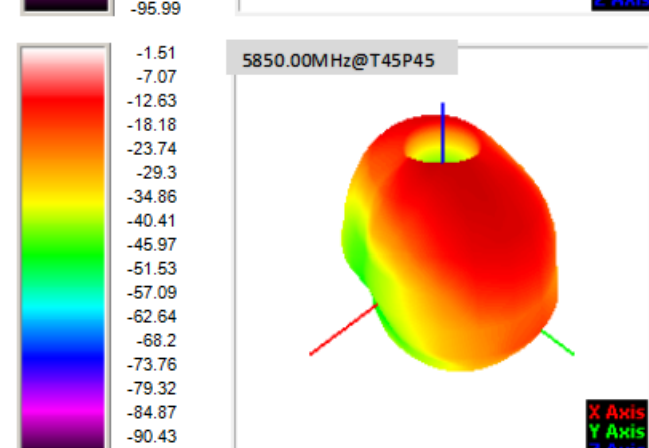
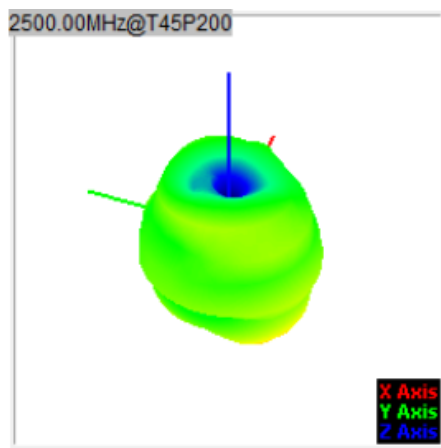
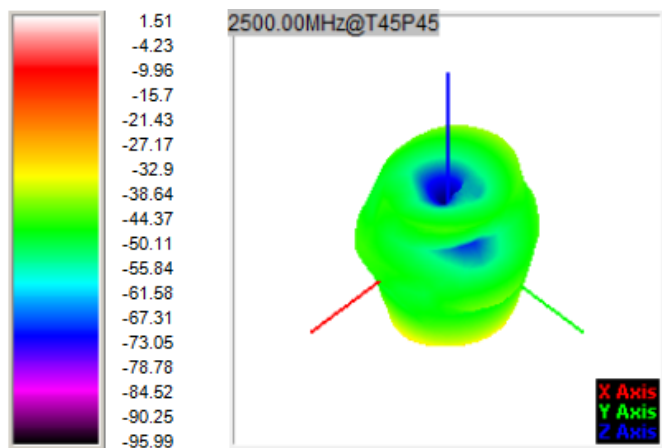
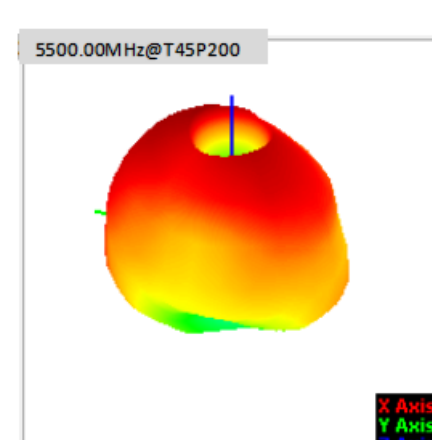
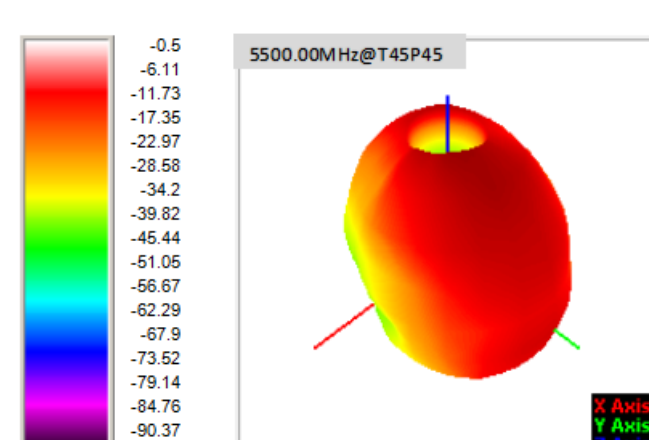
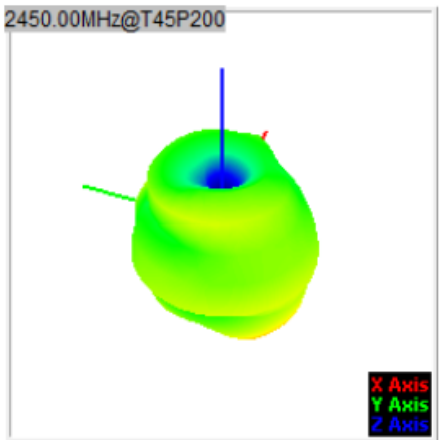
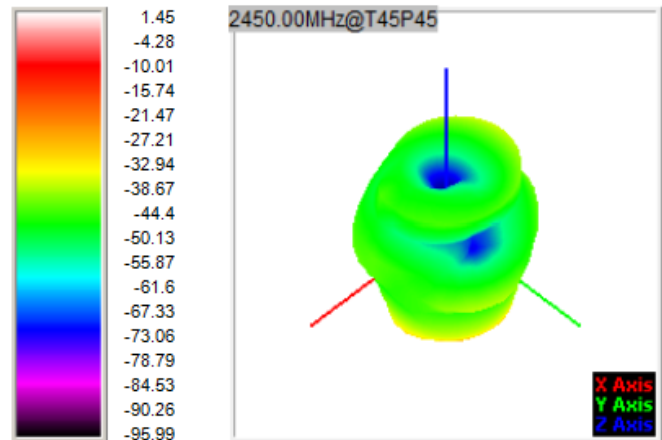
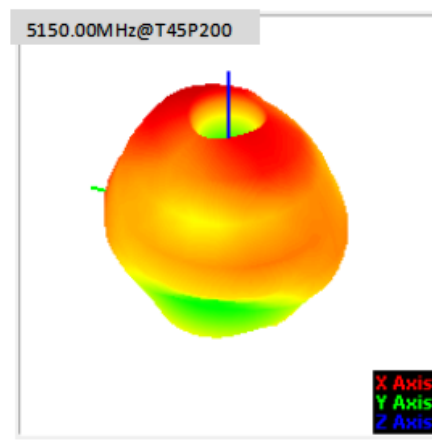
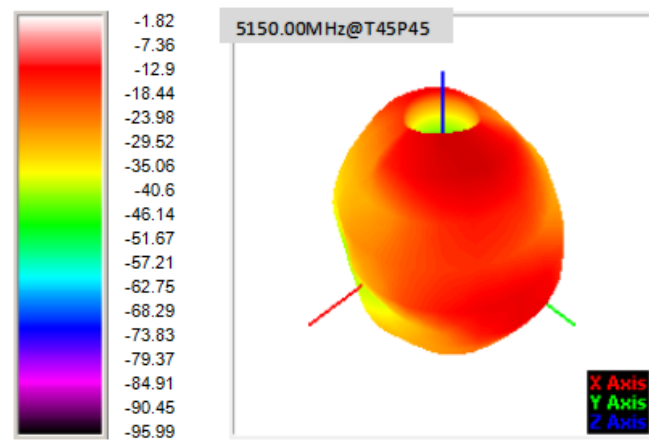
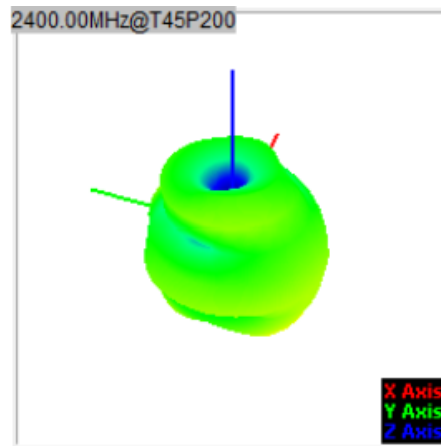
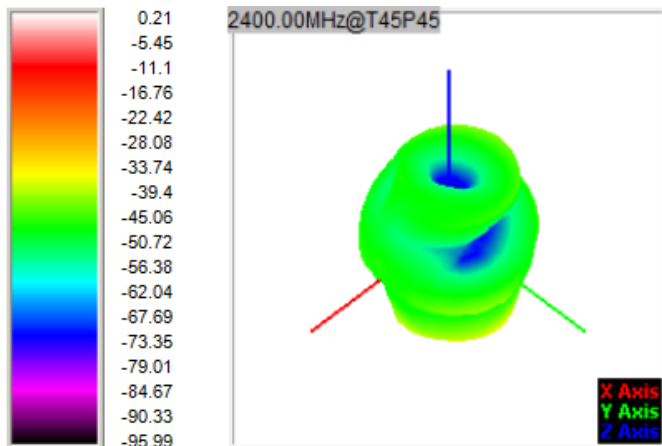
2G AVG Gain(dbi)	850	900	1800	1900	
	-1.56	-1.32	-0.85	-1.2	
3G AVG Gain(dbi)	B2	B4	B5		
	-1.2	-0.85	-1.56		
4G AVG Gain(dbi)	B2	B4	B5	B12	B13
	-1.2	-0.85	-1.56	-1.85	-1.78
	B25	B26	B66	B71	B41
	-1.56	-1.56	-0.85	-2.15	0.62

7.2 2.4G WIFI/BT天线增益

<i>FEITUKEJI</i>											
Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Point Values											
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	-6.92	-6.66	-6.70	-6.36	-6.14	-5.94	-5.88	-5.93	-5.94	-6.24	-6.32
Peak EIRP (dBm)	0.21	0.50	0.40	0.78	1.07	1.45	1.67	1.79	1.82	1.61	1.51
Directivity (dBi)	7.14	7.16	7.10	7.14	7.22	7.39	7.55	7.73	7.76	7.85	7.83
Efficiency (dB)	-6.92	-6.66	-6.70	-6.36	-6.14	-5.94	-5.88	-5.93	-5.94	-6.24	-6.32
Efficiency (%)	20.30	21.60	21.40	23.10	24.30	25.50	25.80	25.50	25.50	23.80	23.30
Gain (dBi)	0.21	0.50	0.40	0.78	1.07	1.45	1.67	1.79	1.82	1.61	1.51
NHPRP ±Pi/4 (dBm)	-9.25	-8.98	-9.11	-8.78	-8.55	-8.21	-8.09	-8.12	-8.22	-8.58	-8.83
NHPRP ±Pi/6 (dBm)	-11.07	-10.82	-10.97	-10.66	-10.46	-10.15	-10.06	-10.12	-10.25	-10.64	-10.93
NHPRP ±Pi/8 (dBm)	-12.02	-11.77	-11.94	-11.65	-11.47	-11.18	-11.11	-11.20	-11.38	-11.82	-12.17
Upper Hem. PRP (dBm)	-11.98	-11.74	-11.80	-11.47	-11.25	-11.06	-11.06	-11.18	-11.23	-11.58	-11.68
Lower Hem. PRP (dBm)	-8.55	-8.27	-8.30	-7.96	-7.75	-7.53	-7.45	-7.47	-7.46	-7.75	-7.82
Upper Hem. PRP (%)	6.33	6.69	6.60	7.13	7.50	7.83	7.84	7.62	7.53	6.95	6.79
Lower Hem. PRP (%)	13.98	14.90	14.79	15.98	16.80	17.66	17.97	17.89	17.94	16.81	16.54

7.2 5G WIFI天线增益

FEITUKEJI															
Frequency ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frequency (MHz)	5150.0	5200.0	5250.0	5300.0	5350.0	5400.0	5450.0	5500.0	5550.0	5600.0	5650.0	5700.0	5750.0	5800.0	5850.0
Point Values															
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	-6.09	-6.59	-6.83	-6.17	-6.82	-6.29	-6.38	-6.16	-5.87	-7.20	-7.15	-7.35	-7.43	-6.61	-6.99
Peak EIRP (dBm)	-1.82	-1.82	-1.73	-0.74	-1.07	-0.49	-0.65	-0.50	0.04	-1.31	-1.48	-1.93	-2.00	-1.14	-1.51
Directivity (dBi)	4.27	4.77	5.10	5.44	5.75	5.81	5.73	5.66	5.91	5.90	5.67	5.43	5.42	5.46	5.48
Efficiency (dB)	-6.09	-6.59	-6.83	-6.17	-6.82	-6.29	-6.38	-6.16	-5.87	-7.20	-7.15	-7.35	-7.43	-6.61	-6.99
Efficiency (%)	24.60	21.90	20.80	24.10	20.80	23.50	23.00	24.20	25.90	19.00	19.30	18.40	18.10	21.80	20.00
Gain (dBi)	-1.82	-1.82	-1.73	-0.74	-1.07	-0.49	-0.65	-0.50	0.04	-1.31	-1.48	-1.93	-2.00	-1.14	-1.51
NHPRP ±Pi/4 (dBm)	-8.02	-8.53	-8.53	-7.89	-8.61	-8.19	-8.26	-8.07	-7.71	-9.11	-9.37	-9.87	-10.08	-9.33	-9.71
NHPRP ±Pi/6 (dBm)	-9.58	-10.09	-10.09	-9.45	-10.18	-9.76	-9.84	-9.66	-9.34	-10.79	-11.06	-11.58	-11.83	-11.13	-11.56
NHPRP ±Pi/8 (dBm)	-10.74	-11.24	-11.19	-10.53	-11.26	-10.84	-10.95	-10.76	-10.45	-11.92	-12.19	-12.70	-12.96	-12.29	-12.74
Upper Hem. PRP (dBm)	-7.90	-8.27	-8.49	-7.78	-8.31	-7.71	-7.76	-7.53	-7.20	-8.50	-8.44	-8.66	-8.72	-7.88	-8.27
Lower Hem. PRP (dBm)	-10.77	-11.52	-11.80	-11.28	-12.18	-11.84	-12.03	-11.83	-11.66	-13.09	-13.06	-13.22	-13.32	-12.57	-12.92
Upper Hem. PRP (%)	16.20	14.90	14.16	16.68	14.74	16.93	16.75	17.66	19.04	14.13	14.31	13.63	13.42	16.31	14.88
Lower Hem. PRP (%)	8.38	7.05	6.60	7.45	6.05	6.55	6.27	6.56	6.83	4.91	4.94	4.76	4.66	5.54	5.11



8.1 天线结构图

