

Validation Dipole 450MHz, d = 15 mm

Frequency: 450 MHz; Antenna Input Power: 250 [mW]

Flat Phantom; Planar Section

Probe: ET3DV6 - SNI590; ConvF(7.36,7.36,7.36); Crest factor: 1.0

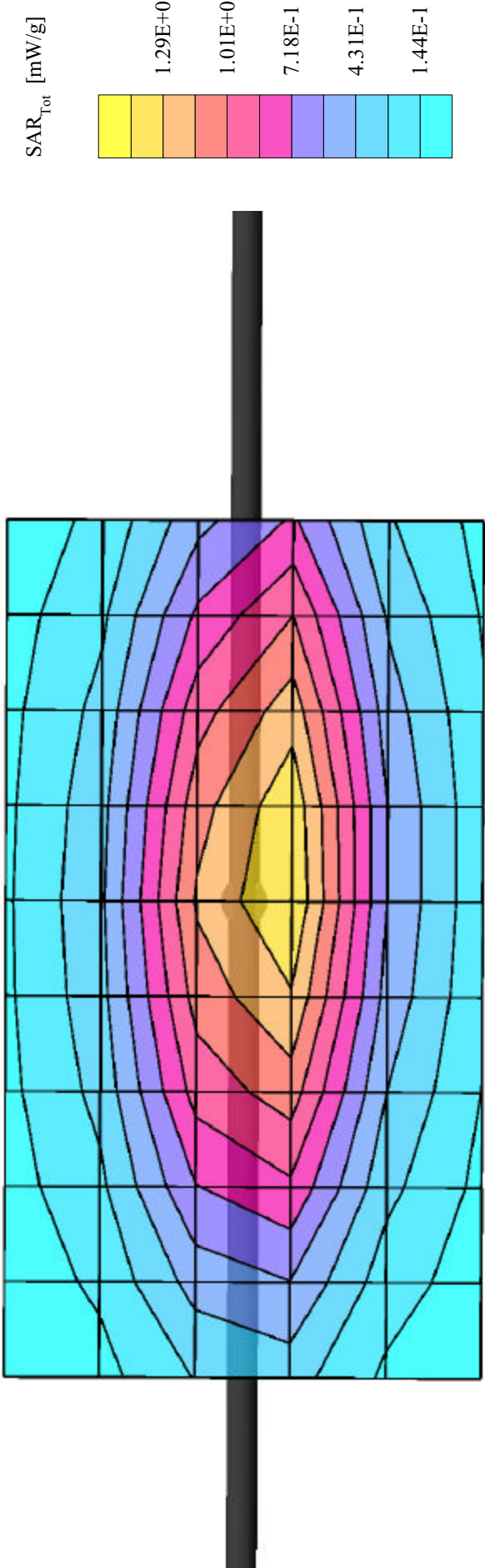
450 MHz Brain: $\sigma = 0.87$ mho/m $\epsilon_r = 43.5$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 2.34 mW/g, SAR (1g): 1.47 mW/g, SAR (10g): 0.963 mW/g, (Worst-case extrapolation)

Penetration depth: 12.3 (10.7, 14.4) [mm]

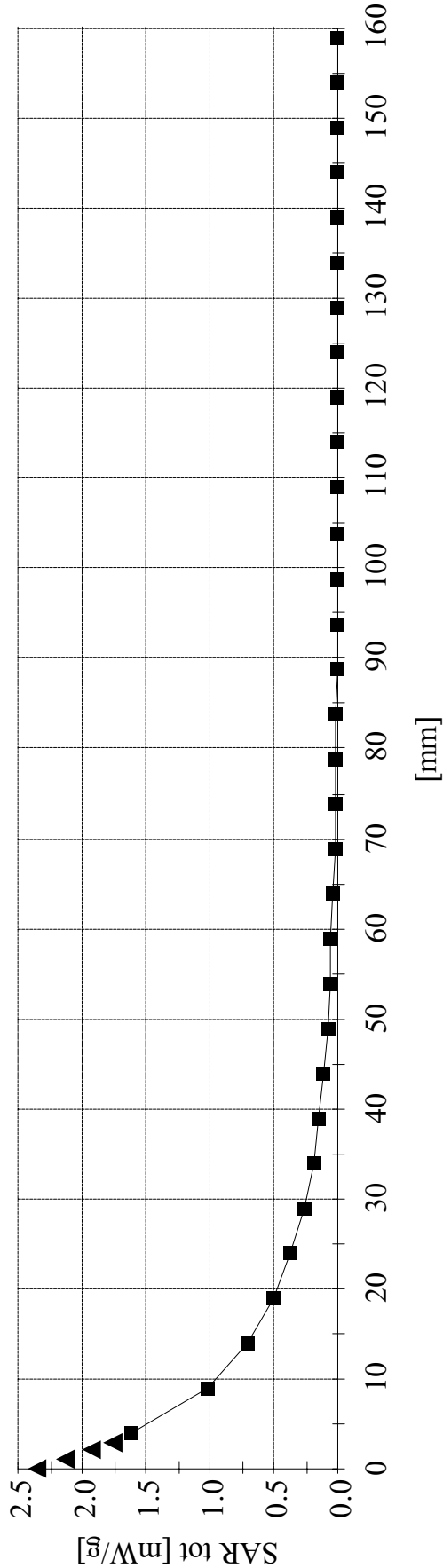
Powerdrift: 0.02 dB

Calibration Date: Oct. 17, 2001



Validation Dipole 450MHz, d = 15 mm
Flat Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0
450 MHz Brain: $\sigma = 0.87$ mho/m $\epsilon_r = 43.5$ $\rho = 1.00$ g/cm³
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0

Test Date: October 17, 2001
conducted power: 250 mW



APPENDIX D - PROBE CALIBRATION

Probe ET3DV6

SN:1590

Manufactured:	March 19, 2001
Calibrated:	March 26, 2001

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1590

Sensitivity in Free Space

NormX	1.77 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.91 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.67 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	100 mV
DCP Y	100 mV
DCP Z	100 mV

Sensitivity in Tissue Simulating Liquid

Head **450 MHz** $\epsilon_r = 43.5 \pm 5\%$ $\sigma = 0.87 \pm 10\% \text{ mho}/\text{m}$

ConvF X	7.36 extrapolated	Boundary effect:	
ConvF Y	7.36 extrapolated	Alpha	0.29
ConvF Z	7.36 extrapolated	Depth	2.72

Head **900 MHz** $\epsilon_r = 42 \pm 5\%$ $\sigma = 0.97 \pm 10\% \text{ mho}/\text{m}$

ConvF X	6.83 $\pm 7\%$ (k=2)	Boundary effect:	
ConvF Y	6.83 $\pm 7\%$ (k=2)	Alpha	0.37
ConvF Z	6.83 $\pm 7\%$ (k=2)	Depth	2.48

Head **1500 MHz** $\epsilon_r = 40.4 \pm 5\%$ $\sigma = 1.23 \pm 10\% \text{ mho}/\text{m}$

ConvF X	6.13 interpolated	Boundary effect:	
ConvF Y	6.13 interpolated	Alpha	0.47
ConvF Z	6.13 interpolated	Depth	2.17

Head **1800 MHz** $\epsilon_r = 40 \pm 5\%$ $\sigma = 1.40 \pm 10\% \text{ mho}/\text{m}$

ConvF X	5.78 $\pm 7\%$ (k=2)	Boundary effect:	
ConvF Y	5.78 $\pm 7\%$ (k=2)	Alpha	0.53
ConvF Z	5.78 $\pm 7\%$ (k=2)	Depth	2.01

Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.2 $\pm$ 0.2	mm

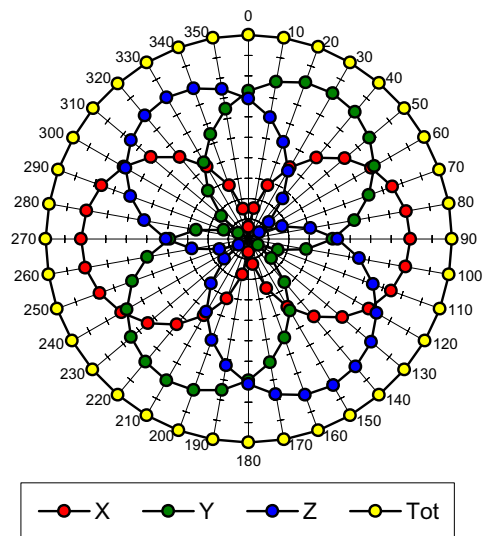
ET3DV6 SN:1590

DASY3 - Parameters of Probe: ET3DV6 SN: 1590

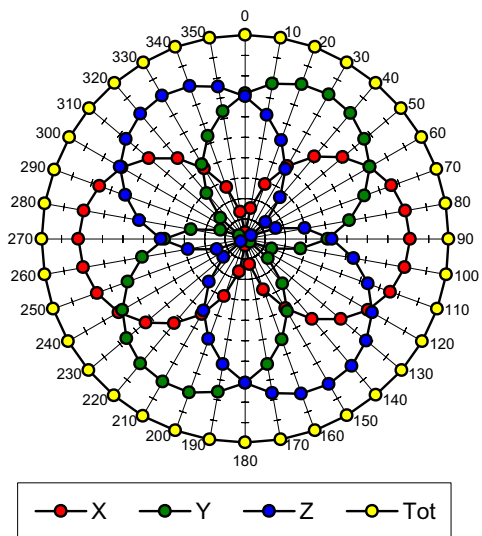
Body	450 MHz	$\epsilon_r = 56.7 \pm 5\%$	$\sigma = 0.94 \pm 10\%$ mho/m
ConvF X	7.23	extrapolated	
ConvF Y	7.23	extrapolated	
ConvF Z	7.23	extrapolated	
Body	900 MHz	$\epsilon_r = 55.0 \pm 5\%$	$\sigma = 1.05 \pm 10\%$ mho/m
ConvF X	6.61	$\pm 7\%$ (k=2)	
ConvF Y	6.61	$\pm 7\%$ (k=2)	
ConvF Z	6.61	$\pm 7\%$ (k=2)	
Body	1500 MHz	$\epsilon_r = 54.0 \pm 5\%$	$\sigma = 1.30 \pm 10\%$ mho/m
ConvF X	5.78	interpolated	
ConvF Y	5.78	interpolated	
ConvF Z	5.78	interpolated	
Body	1800 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 10\%$ mho/m
ConvF X	5.36	$\pm 7\%$ (k=2)	
ConvF Y	5.36	$\pm 7\%$ (k=2)	
ConvF Z	5.36	$\pm 7\%$ (k=2)	

Receiving Pattern (ϕ), $\theta = 0^\circ$

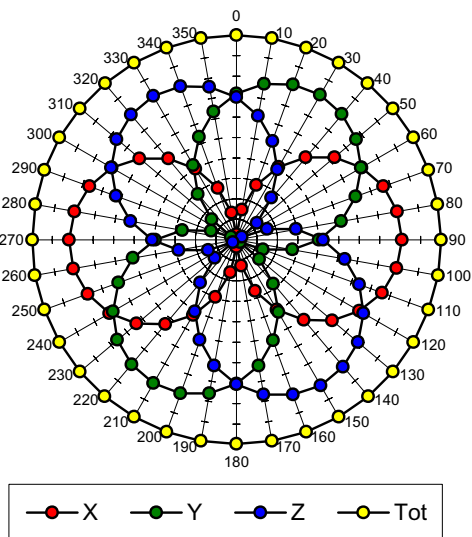
f = 30 MHz, TEM cell ifi110



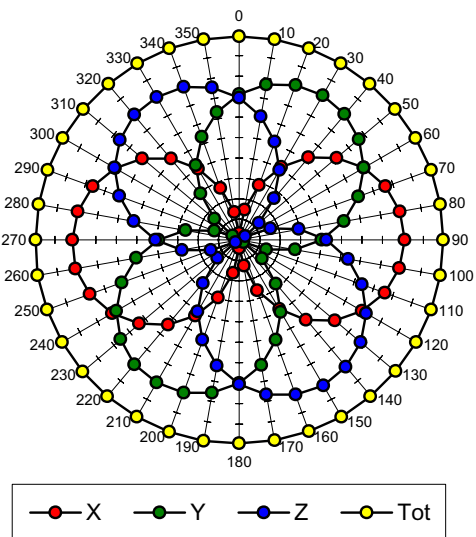
f = 100 MHz, TEM cell ifi110

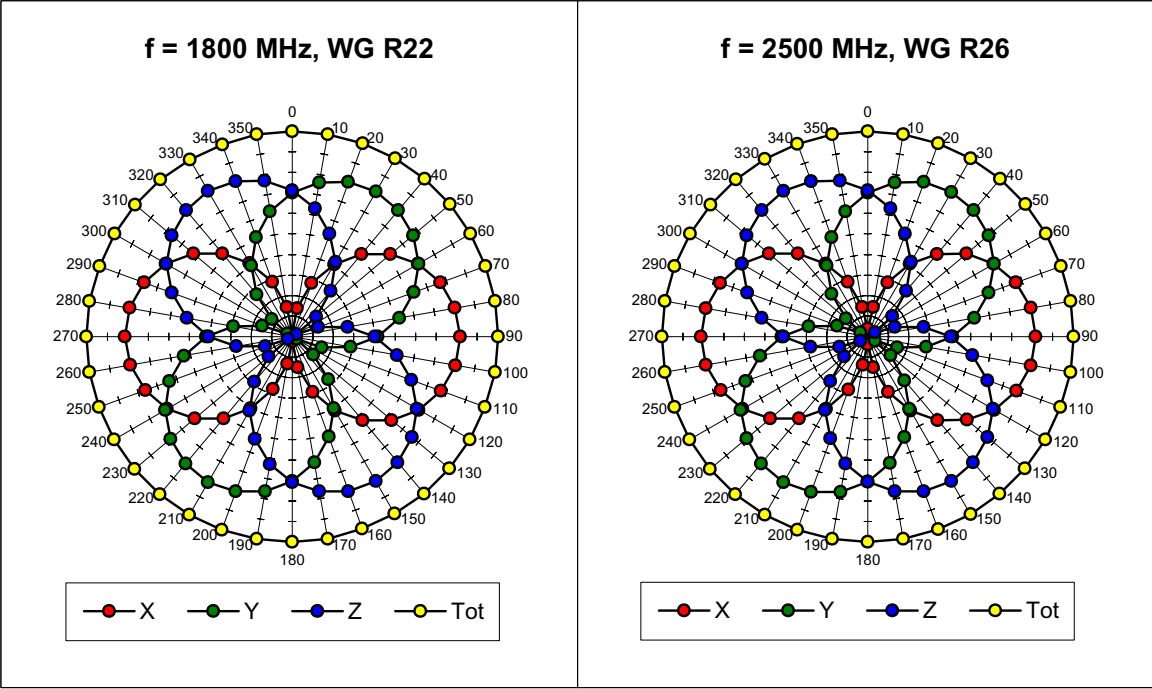


f = 300 MHz, TEM cell ifi110

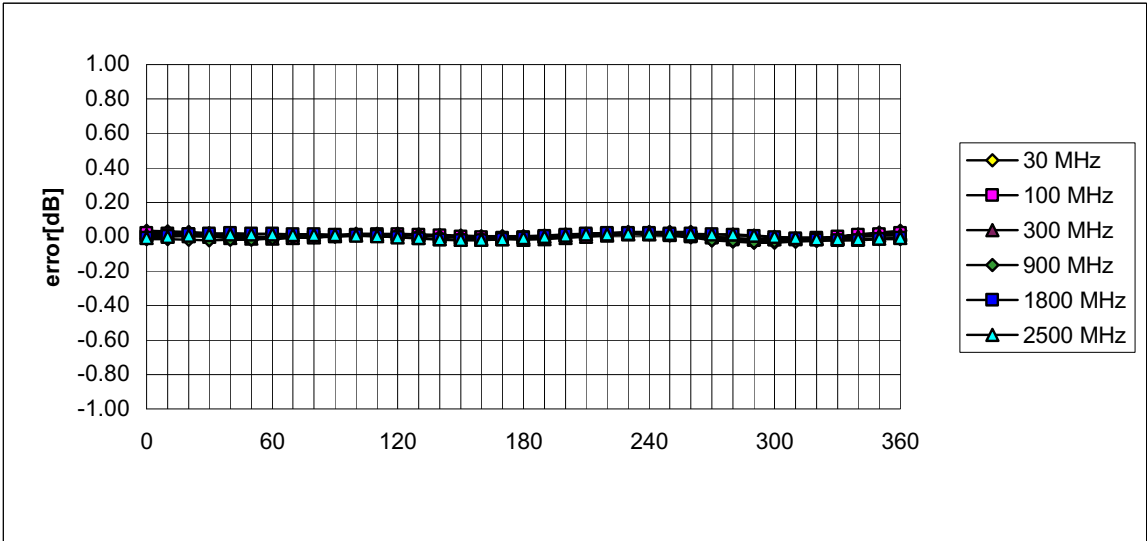


f = 900 MHz, TEM cell ifi110



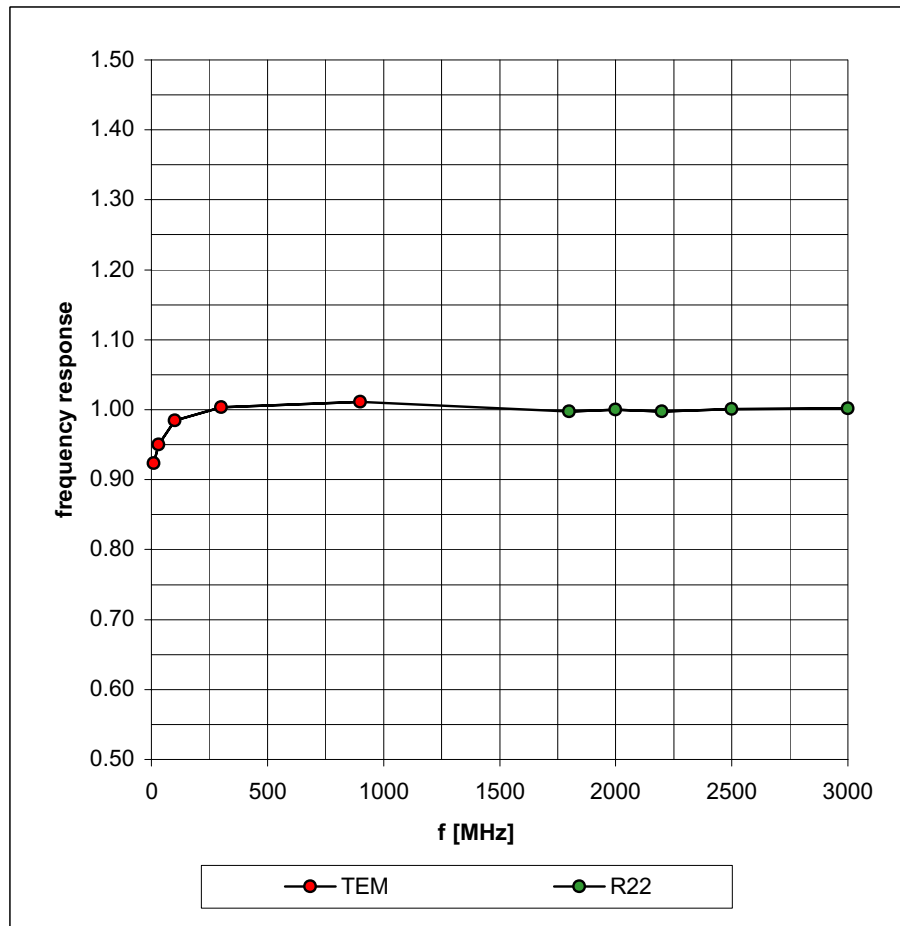


Isotropy Error (ϕ), $\theta = 0^\circ$

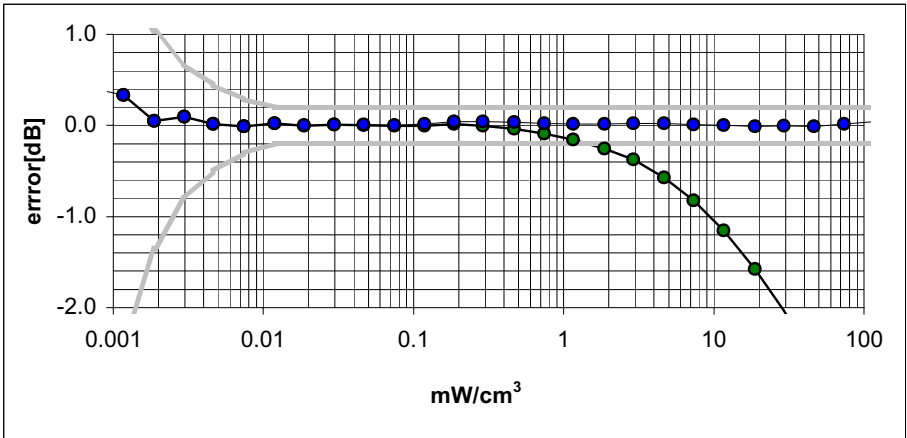
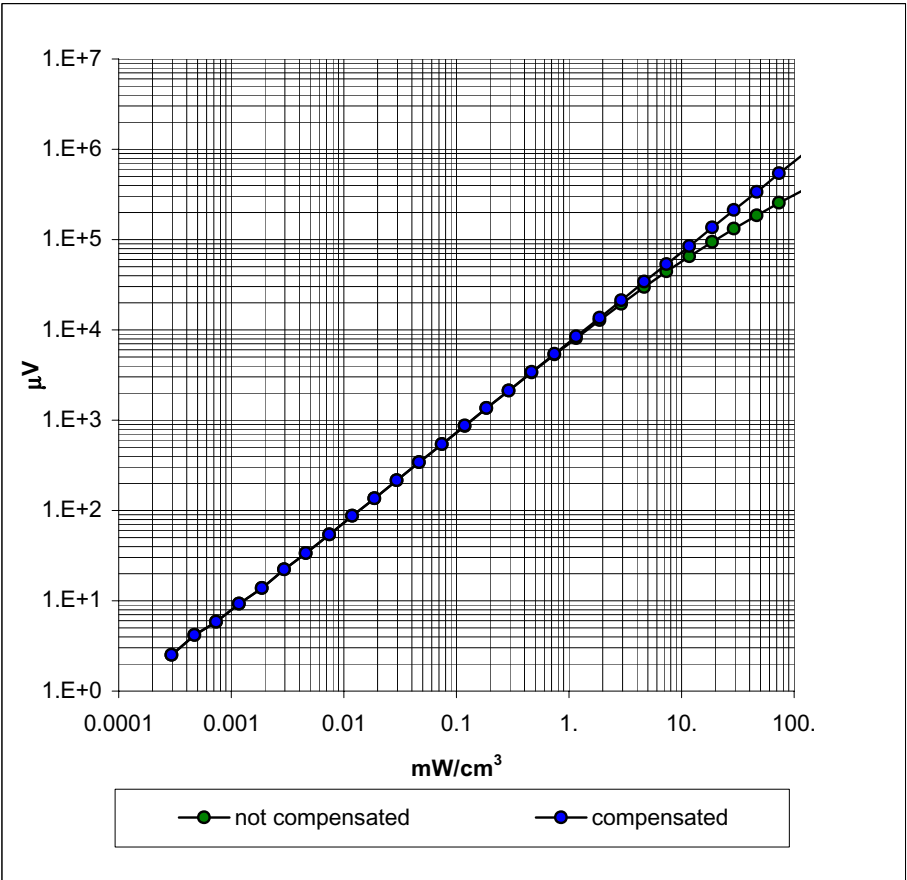


Frequency Response of E-Field

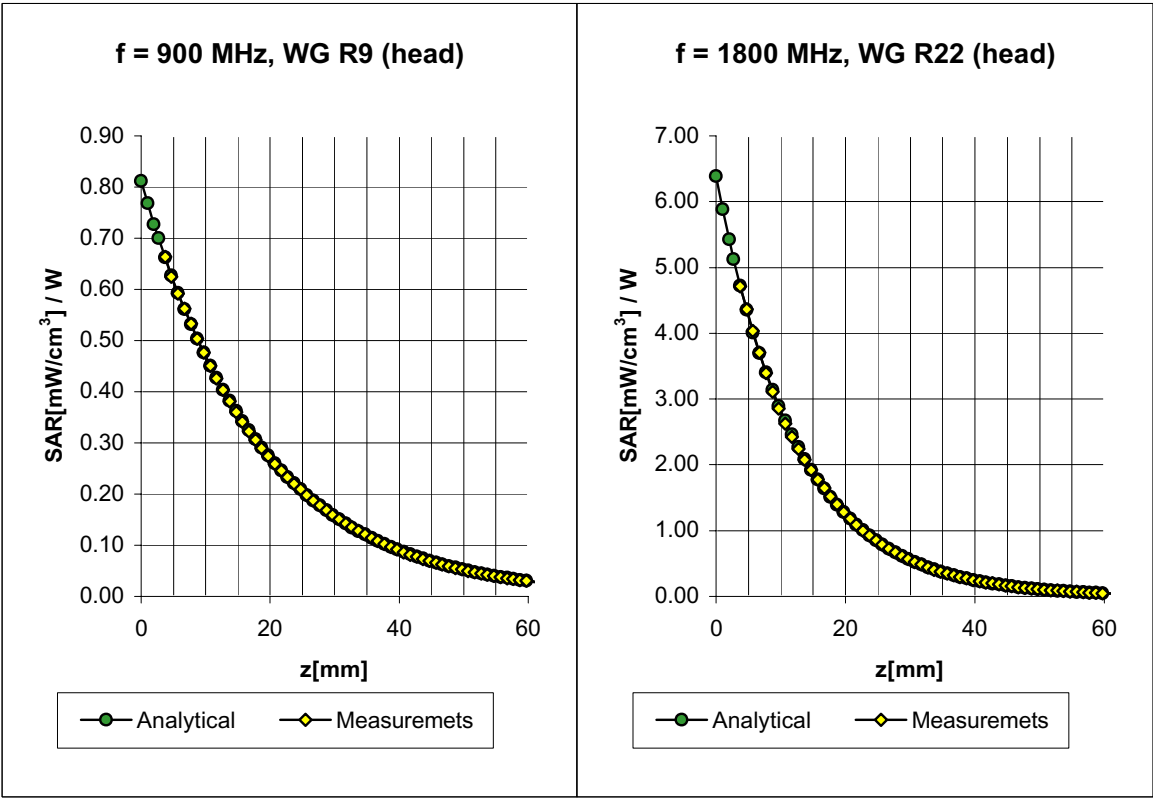
(TEM-Cell:ifi110, Waveguide R22)



Dynamic Range f(SAR_{brain})
(TEM-Cell:ifi110)



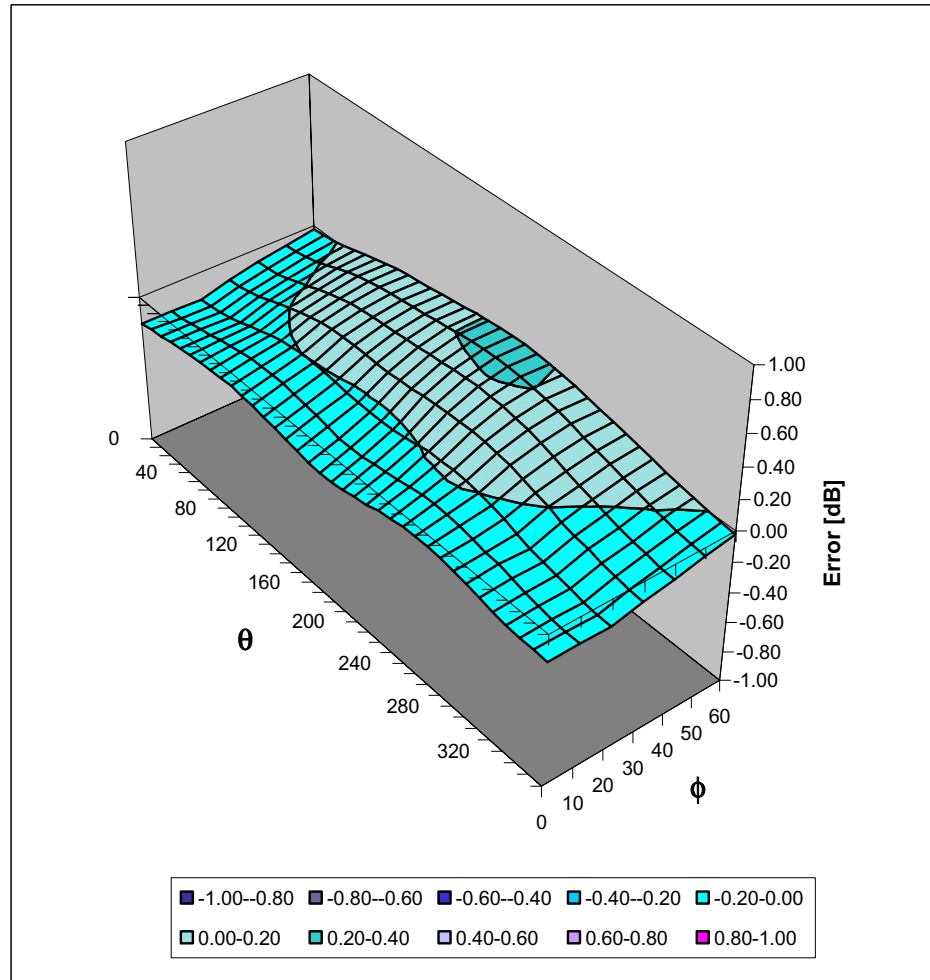
Conversion Factor Assessment



ET3DV6 SN:1590

Deviation from Isotropy in HSL

Error (θ, ϕ), $f = 900$ MHz



APPENDIX E - MEASURED LIQUID DIELECTRIC PARAMETERS

450MHz Validation

Measured Liquid Dielectric Parameters (Head)

January 24, 2002

Frequency	e'	e''
400.000000 MHz	45.3688	36.9026
402.000000 MHz	45.3793	36.7678
404.000000 MHz	45.3288	36.6432
406.000000 MHz	45.2099	36.6123
408.000000 MHz	45.2413	36.4776
410.000000 MHz	45.1672	36.4620
412.000000 MHz	45.0874	36.2641
414.000000 MHz	45.0429	36.1644
416.000000 MHz	44.9594	36.0714
418.000000 MHz	44.9721	35.9449
420.000000 MHz	44.9260	35.8283
422.000000 MHz	44.8864	35.7516
424.000000 MHz	44.8472	35.6756
426.000000 MHz	44.8412	35.5558
428.000000 MHz	44.7586	35.4487
430.000000 MHz	44.7341	35.3337
432.000000 MHz	44.6506	35.2776
434.000000 MHz	44.6051	35.1483
436.000000 MHz	44.5573	35.1269
438.000000 MHz	44.5460	34.9653
440.000000 MHz	44.4766	34.8621
442.000000 MHz	44.4123	34.7876
444.000000 MHz	44.4052	34.7714
446.000000 MHz	44.3575	34.6766
448.000000 MHz	44.3089	34.5734
450.000000 MHz	44.2728	34.4878
452.000000 MHz	44.1883	34.4481
454.000000 MHz	44.1460	34.3184
456.000000 MHz	44.1128	34.2440
458.000000 MHz	44.0590	34.1550
460.000000 MHz	44.0640	34.0850
462.000000 MHz	44.0658	34.0526
464.000000 MHz	44.0370	33.9433
466.000000 MHz	43.9715	33.8864
468.000000 MHz	43.9139	33.8196

450MHz Evaluation

Measured Liquid Dielectric Parameters (Body)

January 24, 2002

Frequency	e'	e''
400.000000 MHz	58.3686	40.2555
402.000000 MHz	58.1138	40.1332
404.000000 MHz	58.3317	40.0938
406.000000 MHz	58.2343	39.7867
408.000000 MHz	58.2609	39.8575
410.000000 MHz	58.1035	39.4510
412.000000 MHz	58.0626	39.5458
414.000000 MHz	58.1905	39.1111
416.000000 MHz	58.0196	39.1695
418.000000 MHz	57.8180	38.8442
420.000000 MHz	57.9597	39.1296
422.000000 MHz	57.9793	38.7851
424.000000 MHz	58.0913	38.6076
426.000000 MHz	57.6902	38.4914
428.000000 MHz	57.7363	38.4901
430.000000 MHz	57.6063	38.2036
432.000000 MHz	57.7064	38.1727
434.000000 MHz	57.7448	38.3324
436.000000 MHz	57.6393	38.0653
438.000000 MHz	57.6462	38.1614
440.000000 MHz	57.6005	37.9442
442.000000 MHz	57.4767	37.9200
444.000000 MHz	57.5385	37.7034
446.000000 MHz	57.5059	37.7396
448.000000 MHz	57.6167	37.4379
450.000000 MHz	57.4913	37.2540
452.000000 MHz	57.3914	37.1907
454.000000 MHz	57.2447	37.0807
456.000000 MHz	57.5367	37.0704
458.000000 MHz	57.4759	36.7363
460.000000 MHz	57.3042	36.8606
462.000000 MHz	57.3184	36.7019
464.000000 MHz	57.1313	36.8293
466.000000 MHz	57.1933	36.7176
468.000000 MHz	57.1422	36.6861

450MHz Validation & Evaluation

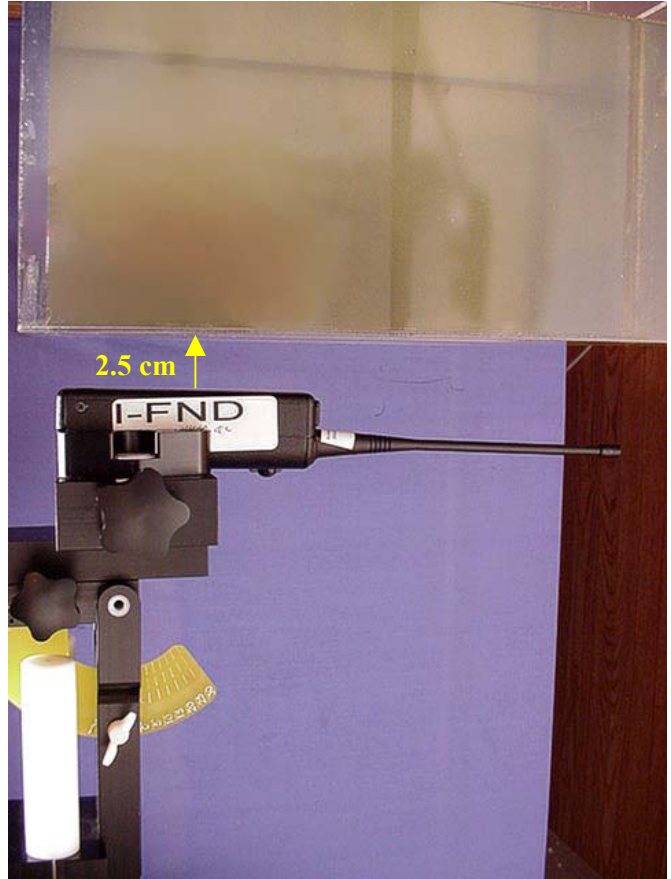
Measured Liquid Dielectric Parameters (Head)

January 25, 2002

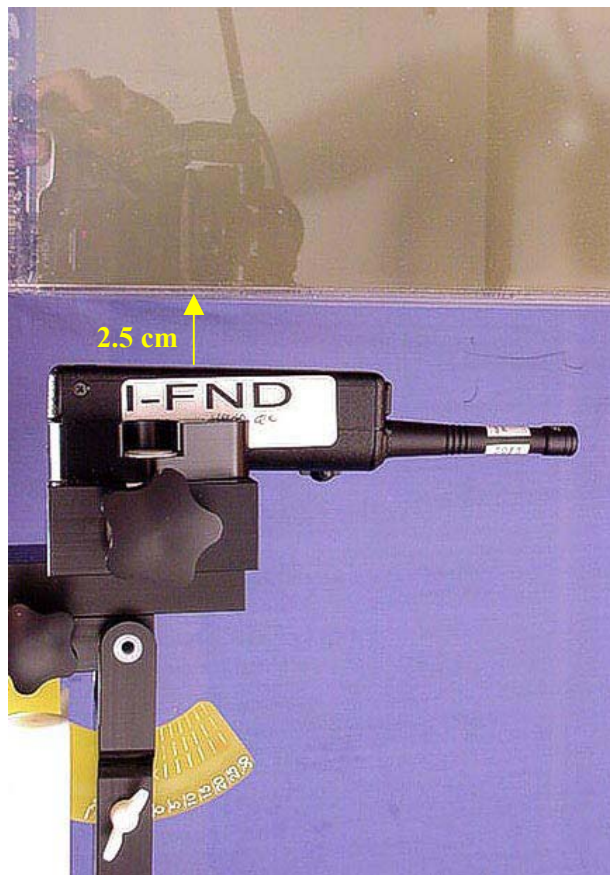
Frequency	ϵ'	ϵ''
400.000000 MHz	45.2075	36.6539
402.000000 MHz	45.2097	36.4593
404.000000 MHz	45.1772	36.3130
406.000000 MHz	45.0790	36.2806
408.000000 MHz	45.0765	36.1938
410.000000 MHz	44.9942	36.1194
412.000000 MHz	44.9039	35.9860
414.000000 MHz	44.8461	35.9301
416.000000 MHz	44.8029	35.8324
418.000000 MHz	44.7710	35.6737
420.000000 MHz	44.7424	35.5360
422.000000 MHz	44.7228	35.4578
424.000000 MHz	44.6977	35.3415
426.000000 MHz	44.7009	35.2811
428.000000 MHz	44.6380	35.1724
430.000000 MHz	44.5653	35.1248
432.000000 MHz	44.4766	35.0316
434.000000 MHz	44.4289	34.8846
436.000000 MHz	44.3801	34.8548
438.000000 MHz	44.3774	34.6838
440.000000 MHz	44.3238	34.6178
442.000000 MHz	44.2708	34.5523
444.000000 MHz	44.2397	34.5029
446.000000 MHz	44.2004	34.3987
448.000000 MHz	44.1595	34.3426
450.000000 MHz	44.1182	34.2216
452.000000 MHz	44.0433	34.1815
454.000000 MHz	44.0015	34.0530
456.000000 MHz	43.9958	33.9754
458.000000 MHz	43.9316	33.9355
460.000000 MHz	43.9473	33.8740
462.000000 MHz	43.9394	33.7801
464.000000 MHz	43.8752	33.7324
466.000000 MHz	43.8178	33.6116
468.000000 MHz	43.7417	33.5400

APPENDIX F - SAR TEST SETUP PHOTOGRAPHS

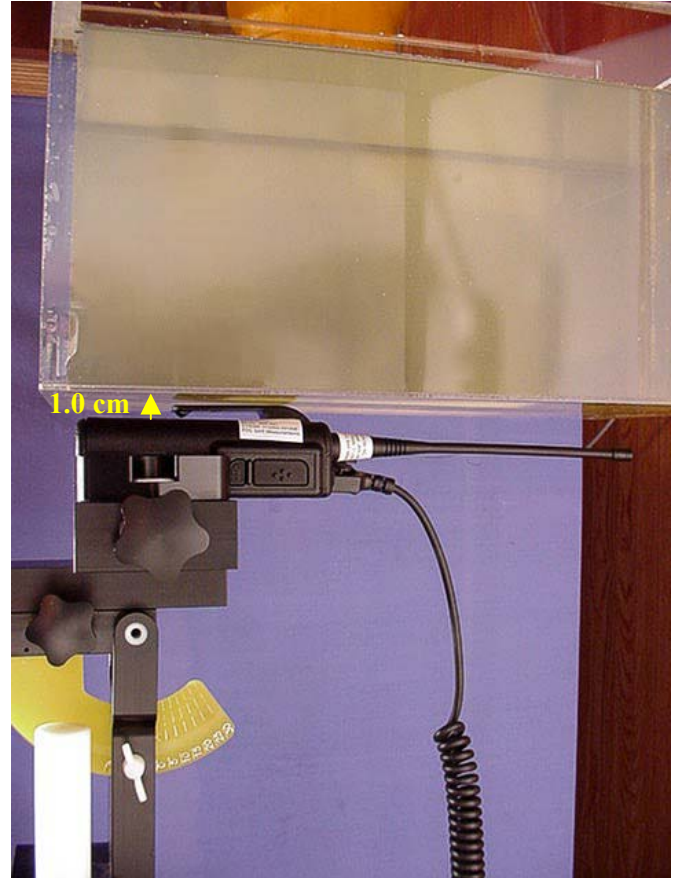
FACE-HELD SAR TEST SETUP PHOTOGRAPHS
With Whip Antenna AFS-450
2.5cm Separation Distance



FACE-HELD SAR TEST SETUP PHOTOGRAPHS
With Stubby Antenna AFS-450S
2.5cm Separation Distance



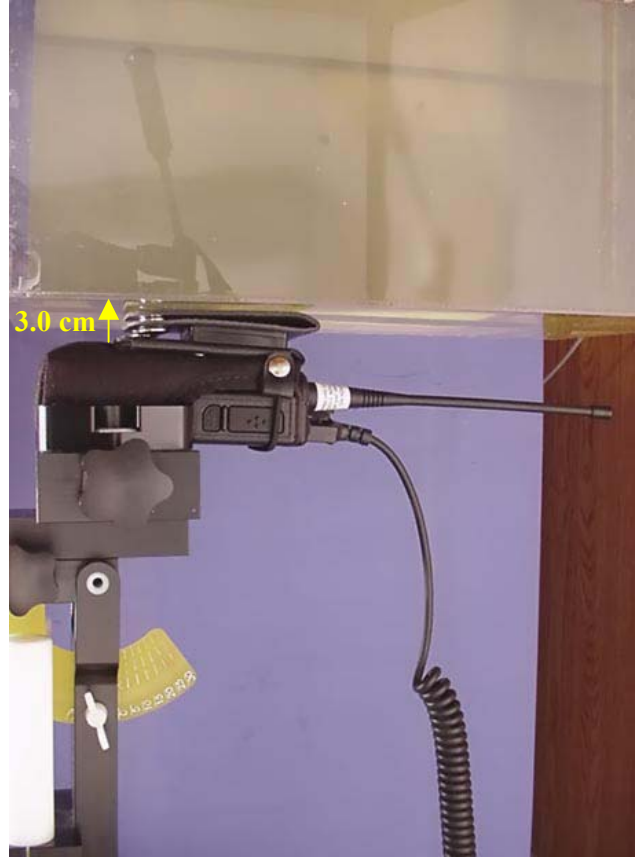
BODY-WORN SAR TEST SETUP PHOTOGRAPHS
with Whip Antenna, 1.0cm Belt-Clip, & Speaker-Mic



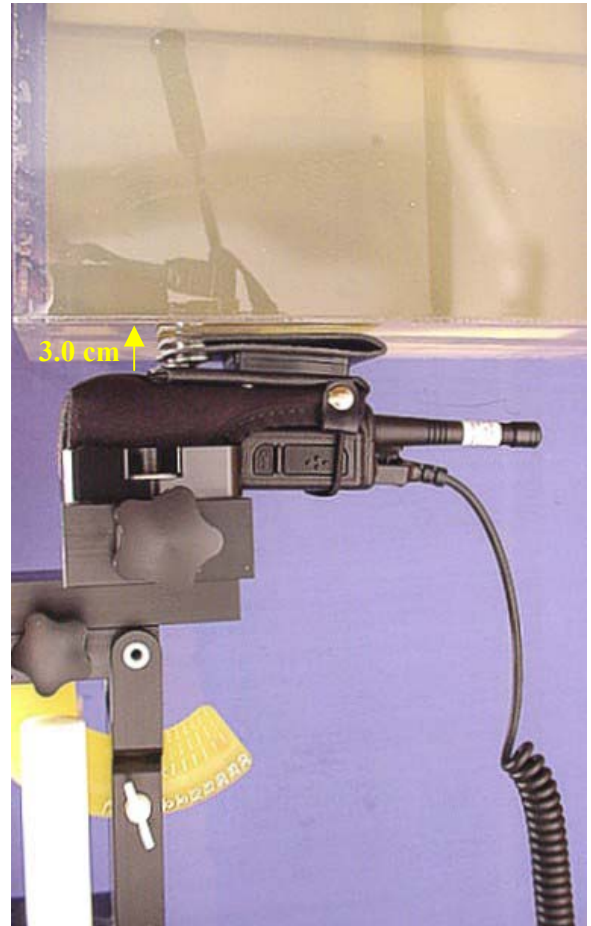
BODY-WORN SAR TEST SETUP PHOTOGRAPHS
with Stubby Antenna, 1.0cm Belt-Clip, & Speaker-Mic



BODY-WORN SAR TEST SETUP PHOTOGRAPHS
with Whip Antenna, 3.0cm Swivel Holster, & Speaker-Mic



BODY-WORN SAR TEST SETUP PHOTOGRAPHS
with Stubby Antenna & 3.0cm Swivel Holster



ANTENNA & BATTERY PHOTOGRAPHS



Whip Antenna (Centurion AFS-450)



Stubby Antenna (Centurion AFS-450S)



Top Side of NiCd & NiMH Batteries



Bottom Side of NiCd & NiMH Batteries