

Schmid & Partner Engineering AG

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Calibration Certificate

Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1545

Place of Calibration:

Zurich

Date of Calibration:

September 24, 2001

Calibration Interval:

12 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:

Nikolaus Meriana

Approved by:

Heinz Klatte

Probe ET3DV6

SN:1545

Manufactured:	October 16, 2000
Last calibration:	November 14, 2000
Recalibrated:	September 24, 2001

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1545

Sensitivity in Free Space

NormX	1.39 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.46 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.39 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	99 mV
DCP Y	99 mV
DCP Z	99 mV

Sensitivity in Tissue Simulating Liquid

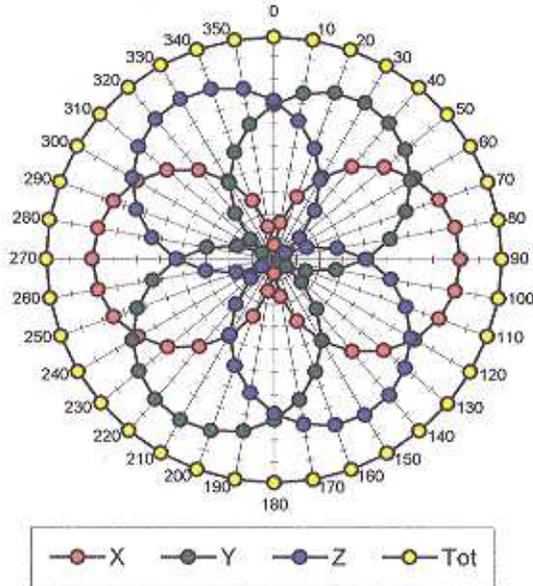
Head	450 MHz	$\epsilon_r = 43.5 \pm 5\%$	$\sigma = 0.87 \pm 10\%$ mho/m
ConvF X	6.99 extrapolated		Boundary effect:
ConvF Y	6.99 extrapolated		Alpha 0.62
ConvF Z	6.99 extrapolated		Depth 1.69
Head	800 - 1000 MHz	$\epsilon_r = 39.0 - 43.5$	$\sigma = 0.80 - 1.10$ mho/m
ConvF X	6.45 $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	6.45 $\pm 9.5\%$ (k=2)		Alpha 0.60
ConvF Z	6.45 $\pm 9.5\%$ (k=2)		Depth 1.87
Head	1500 MHz	$\epsilon_r = 40.4 \pm 5\%$	$\sigma = 1.23 \pm 10\%$ mho/m
ConvF X	5.74 interpolated		Boundary effect:
ConvF Y	5.74 interpolated		Alpha 0.56
ConvF Z	5.74 interpolated		Depth 2.12
Head	1700 - 1910 MHz	$\epsilon_r = 39.5 - 41.0$	$\sigma = 1.20 - 1.55$ mho/m
ConvF X	5.38 $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	5.38 $\pm 9.5\%$ (k=2)		Alpha 0.55
ConvF Z	5.38 $\pm 9.5\%$ (k=2)		Depth 2.24

Sensor Offset

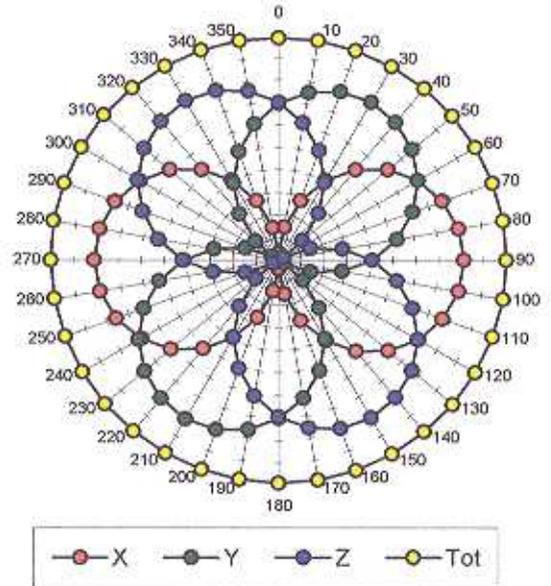
Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.3 \pm 0.2	mm

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

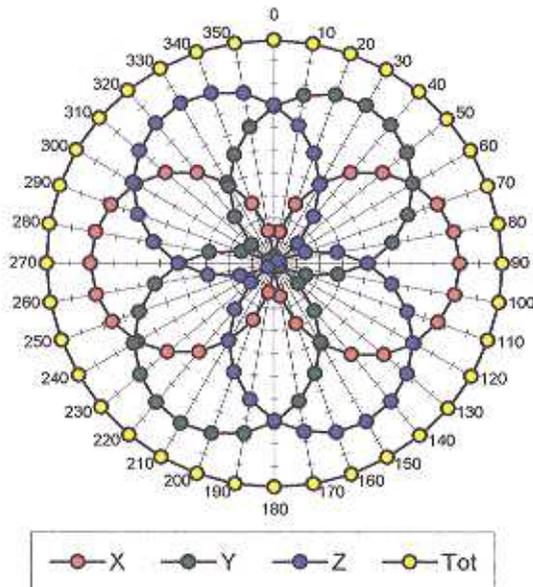
f = 30 MHz, TEM cell ifi110



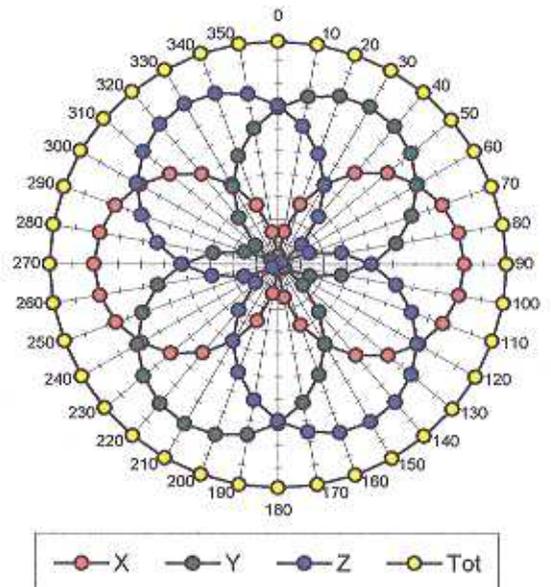
f = 100 MHz, TEM cell ifi110

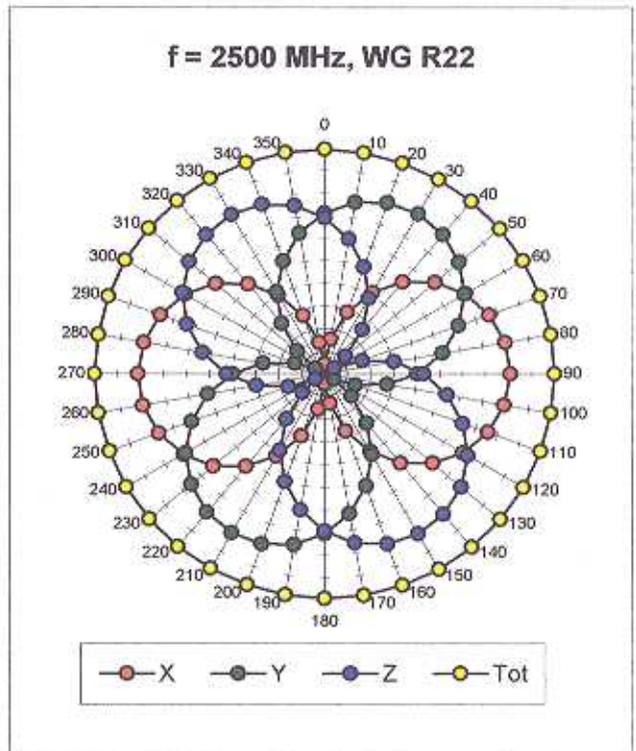
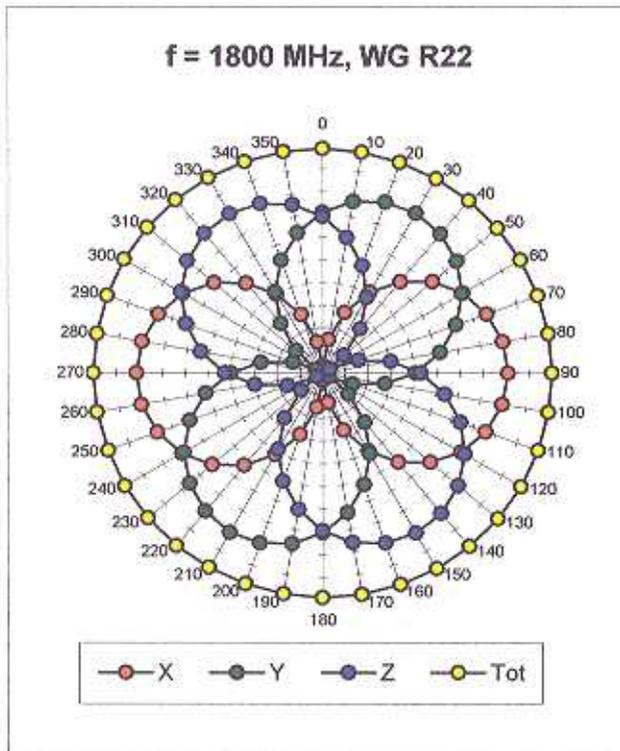


f = 300 MHz, TEM cell ifi110

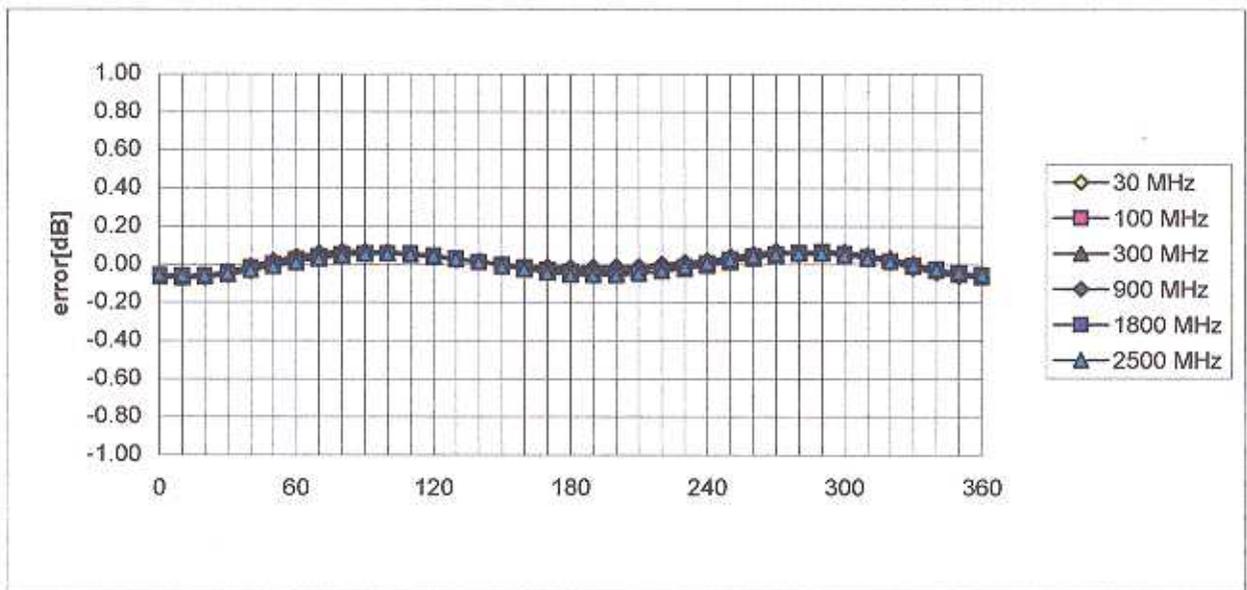


f = 900 MHz, TEM cell ifi110



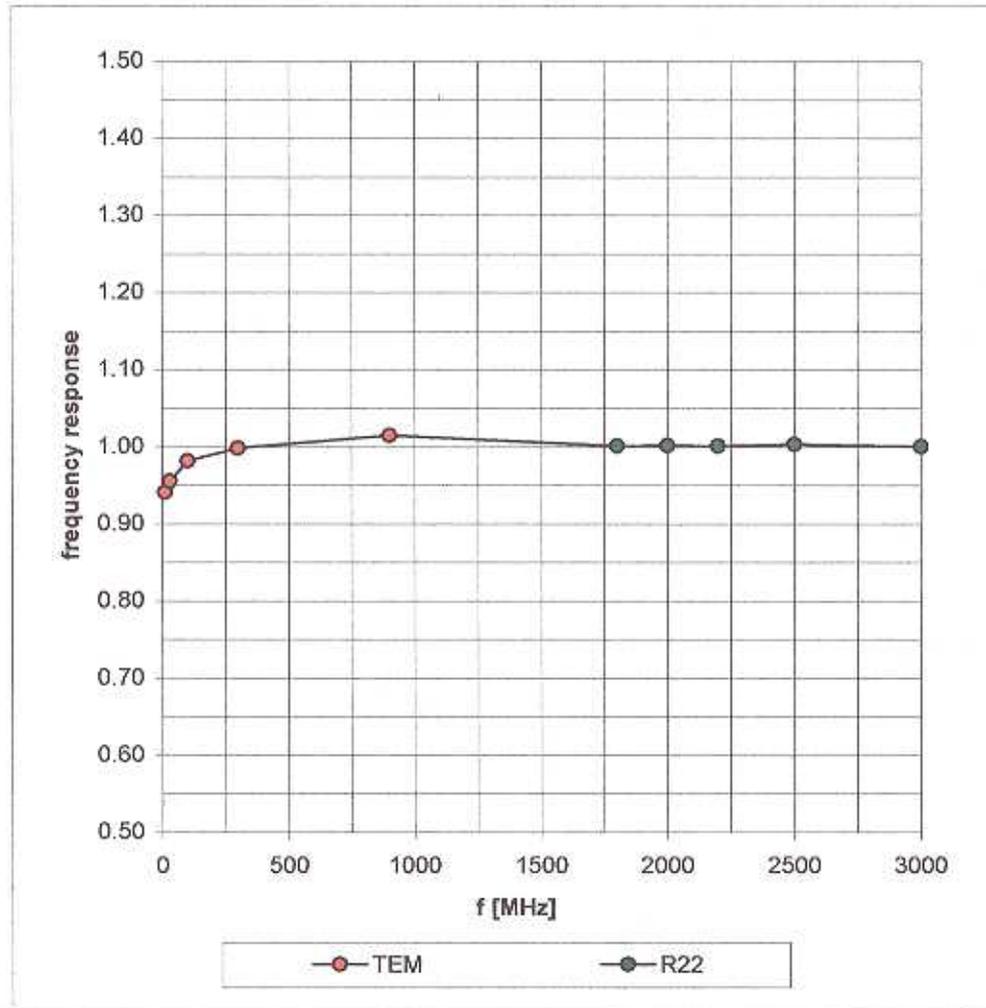


Isotropy Error (ϕ), $\theta = 0^\circ$

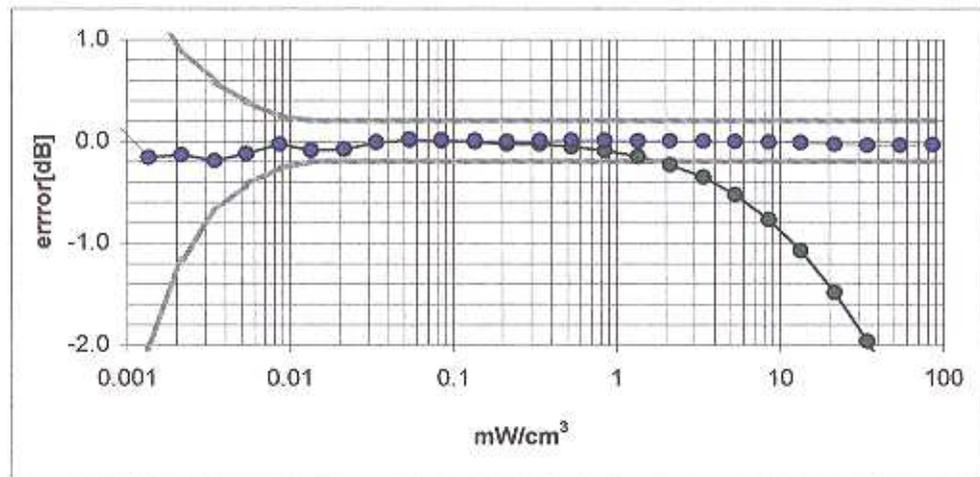
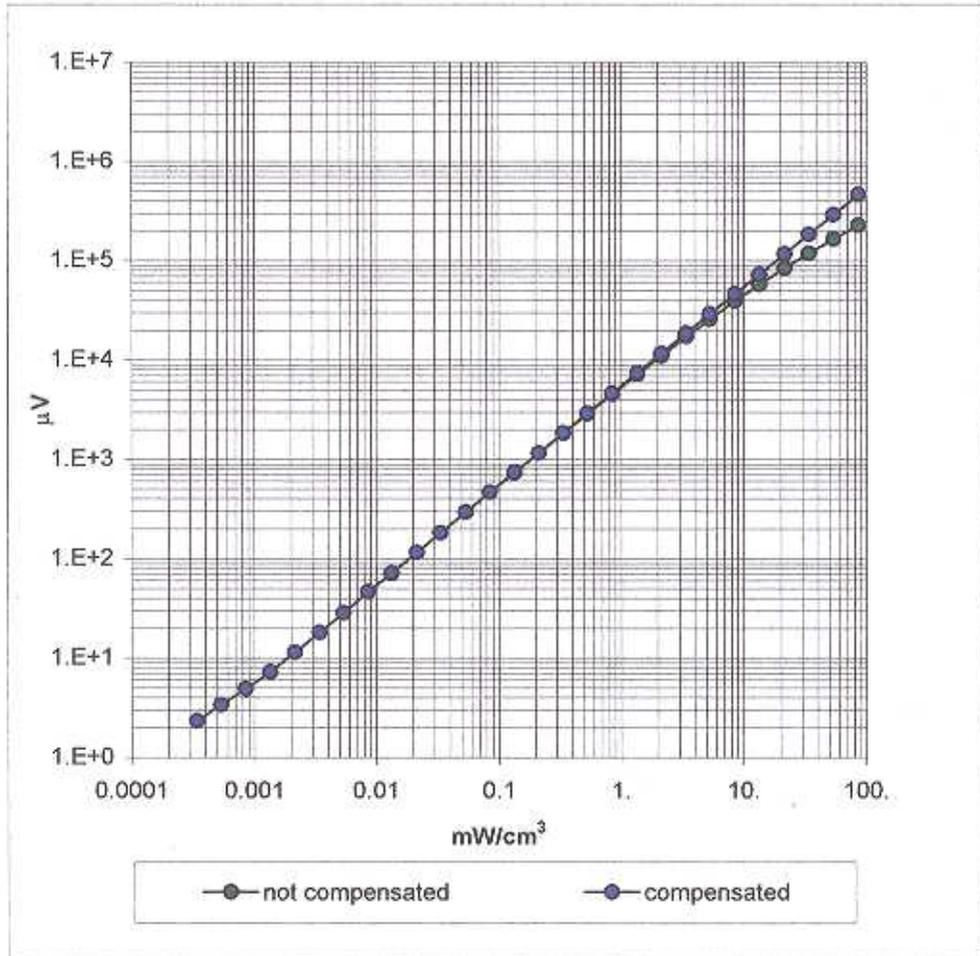


Frequency Response of E-Field

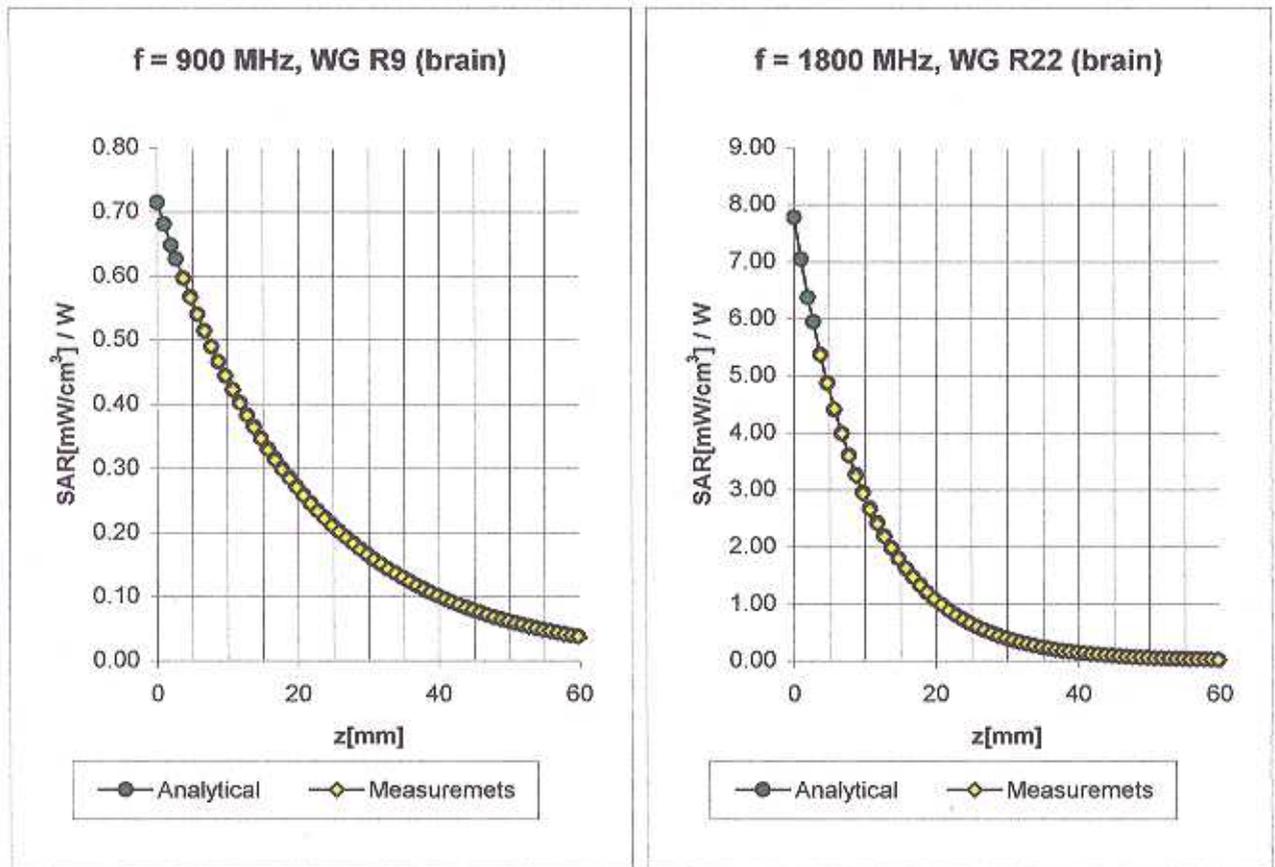
(TEM-Cell:ifi110, Waveguide R22)



Dynamic Range f(SAR_{brain}) (Waveguide R22)



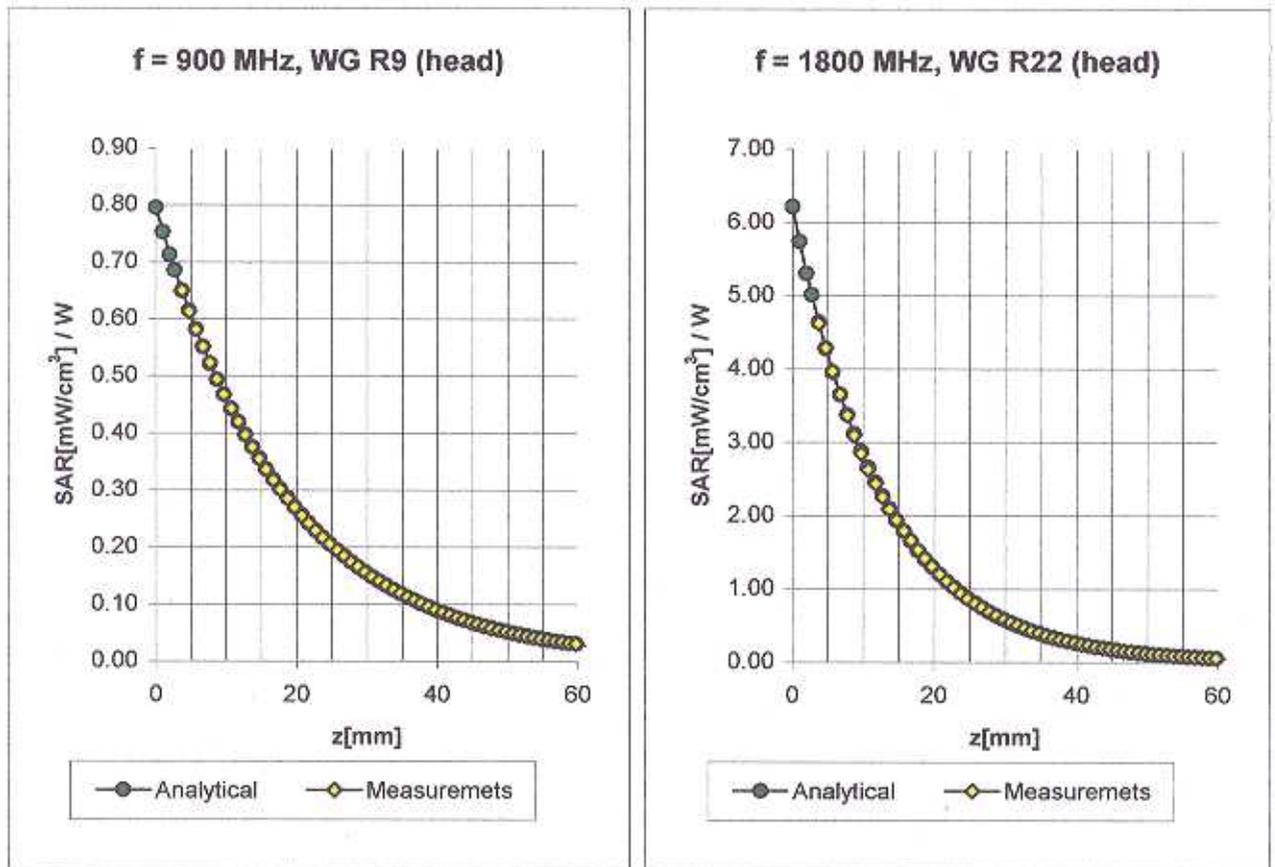
Conversion Factor Assessment



Brain	900 MHz	$\epsilon_r = 42.5 \pm 5\%$	$\sigma = 0.86 \pm 10\% \text{ mho/m}$
	ConvF X	6.26 $\pm 8.8\%$ (k=2)	Boundary effect:
	ConvF Y	6.26 $\pm 8.8\%$ (k=2)	Alpha 0.61
	ConvF Z	6.26 $\pm 8.8\%$ (k=2)	Depth 1.82

Brain	1800 MHz	$\epsilon_r = 41 \pm 5\%$	$\sigma = 1.69 \pm 10\% \text{ mho/m}$
	ConvF X	5.54 $\pm 8.8\%$ (k=2)	Boundary effect:
	ConvF Y	5.54 $\pm 8.8\%$ (k=2)	Alpha 0.58
	ConvF Z	5.54 $\pm 8.8\%$ (k=2)	Depth 2.24

Conversion Factor Assessment



Head 800 - 1000 MHz $\epsilon_r = 39.0 - 43.5$ $\sigma = 0.80 - 1.10$ mho/m

ConvF X **6.45** $\pm 9.5\%$ (k=2)

Boundary effect:

ConvF Y **6.45** $\pm 9.5\%$ (k=2)

Alpha **0.60**

ConvF Z **6.45** $\pm 9.5\%$ (k=2)

Depth **1.87**

Head 1700 - 1910 MHz $\epsilon_r = 39.5 - 41.0$ $\sigma = 1.20 - 1.55$ mho/m

ConvF X **5.38** $\pm 9.5\%$ (k=2)

Boundary effect:

ConvF Y **5.38** $\pm 9.5\%$ (k=2)

Alpha **0.55**

ConvF Z **5.38** $\pm 9.5\%$ (k=2)

Depth **2.24**