



In Collaboration with

s p e a g
CALIBRATION LABORATORY

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 7375

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz] ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	55.5	0.96	9.94	9.94	9.94	0.30	0.85	± 12%
835	55.2	0.97	9.94	9.94	9.94	0.15	1.50	± 12%
900	55.0	1.05	9.89	9.89	9.89	0.21	1.22	± 12%
1750	53.4	1.49	8.22	8.22	8.22	0.23	1.12	± 12%
1900	53.3	1.52	7.62	7.62	7.62	0.19	1.24	± 12%
2000	53.3	1.52	7.90	7.90	7.90	0.16	1.62	± 12%
2100	53.2	1.62	8.17	8.17	8.17	0.17	1.75	± 12%
2300	52.9	1.81	7.43	7.43	7.43	0.45	0.95	± 12%
2450	52.7	1.95	7.33	7.33	7.33	0.33	1.22	± 12%
2600	52.5	2.16	7.16	7.16	7.16	0.48	0.92	± 12%
3500	51.3	3.31	6.52	6.52	6.52	0.44	1.33	± 13%
5200	49.0	5.30	4.82	4.82	4.82	0.45	1.50	± 13%
5300	48.9	5.42	4.57	4.57	4.57	0.45	1.50	± 13%
5500	48.6	5.65	4.20	4.20	4.20	0.48	1.60	± 13%
5600	48.5	5.77	3.99	3.99	3.99	0.50	1.65	± 13%
5800	48.2	6.00	4.08	4.08	4.08	0.55	1.95	± 13%

^C Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequency below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

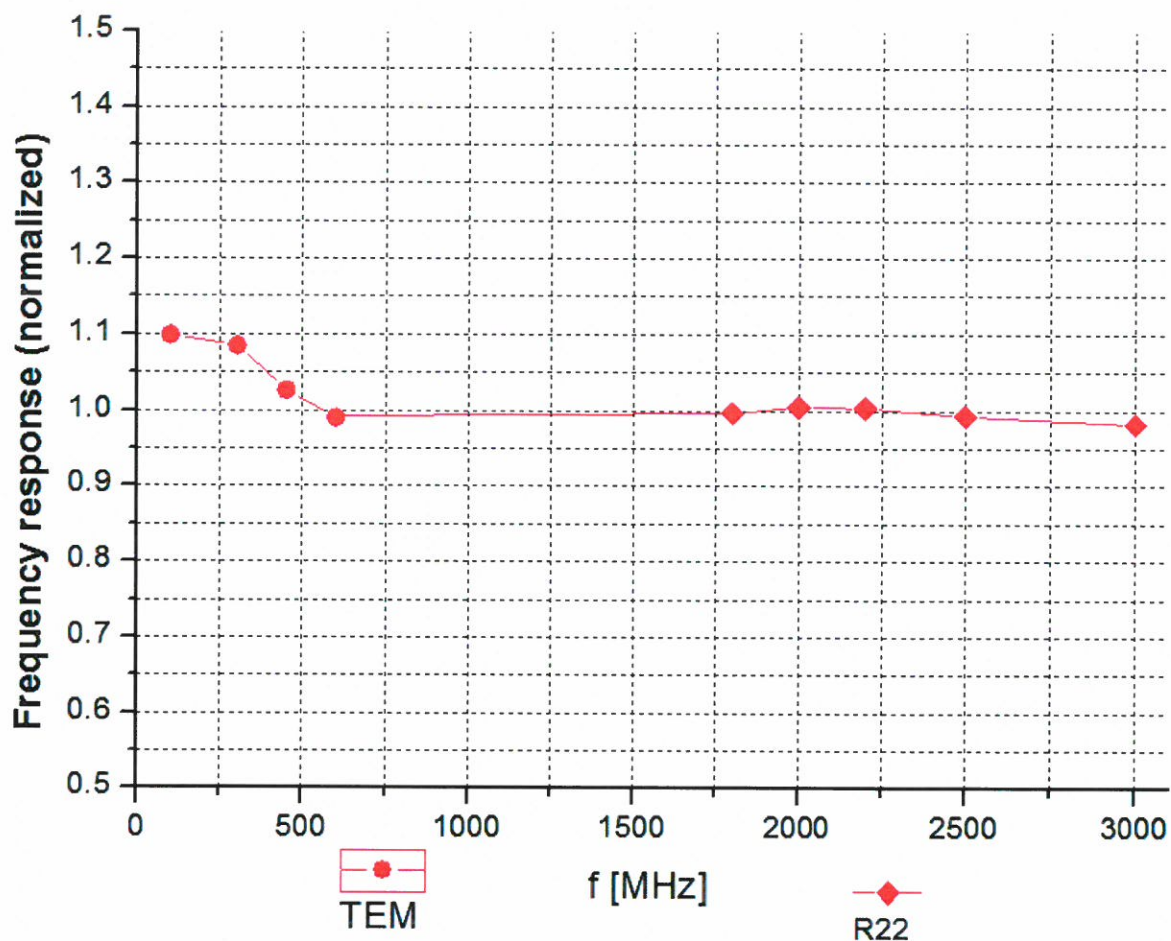
^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



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Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: $\pm 7.5\%$ ($k=2$)

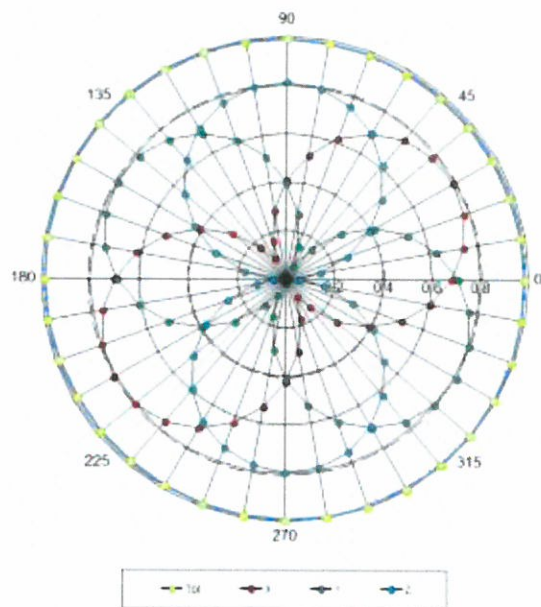


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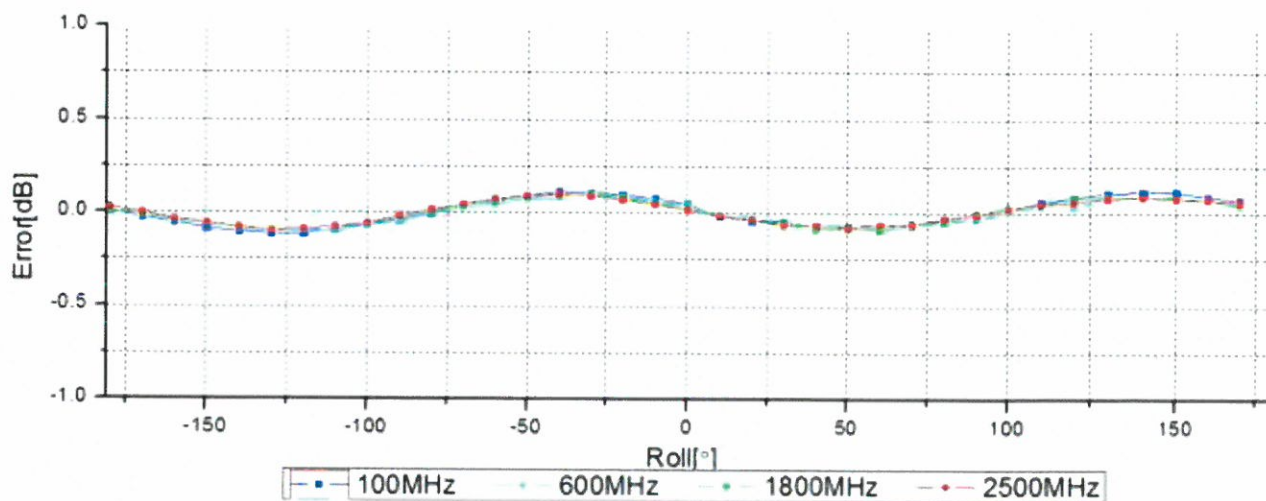
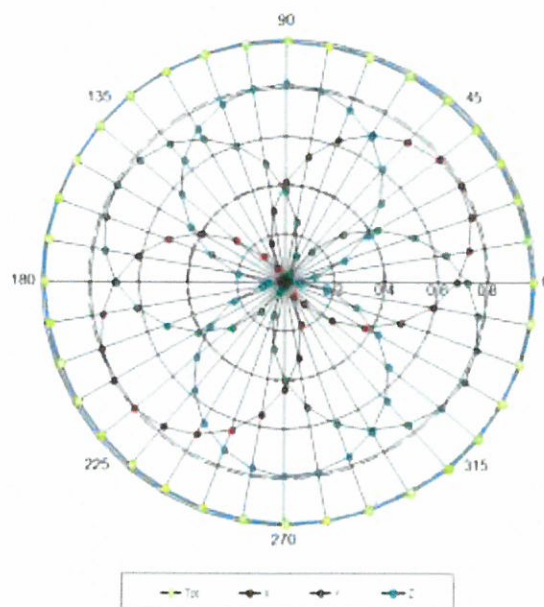
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Receiving Pattern (Φ), $\theta=0^\circ$

f=600 MHz, TEM



f=1800 MHz, R22



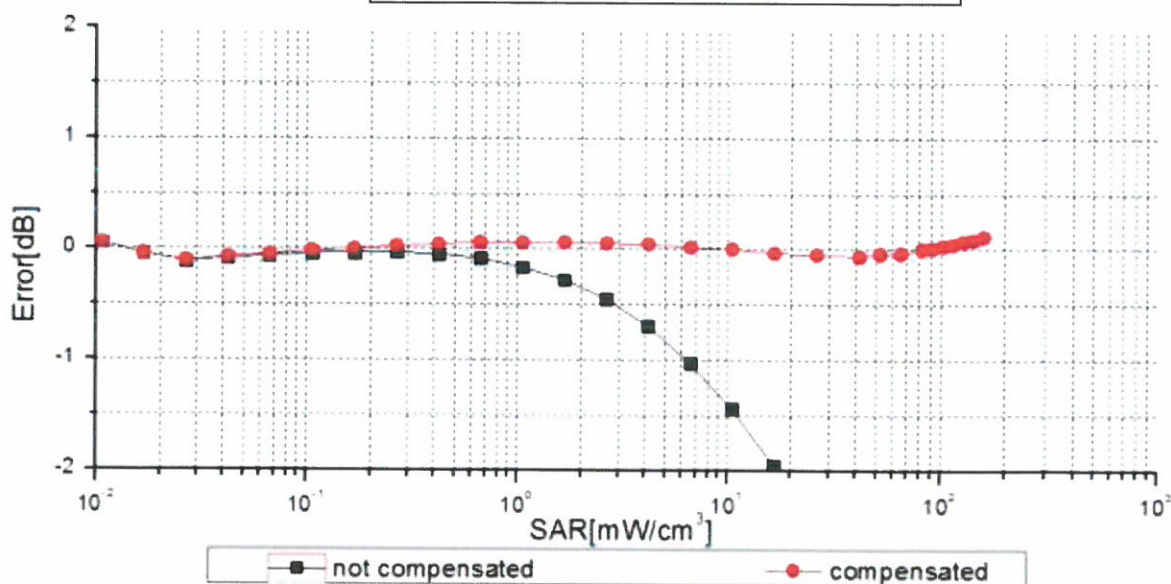
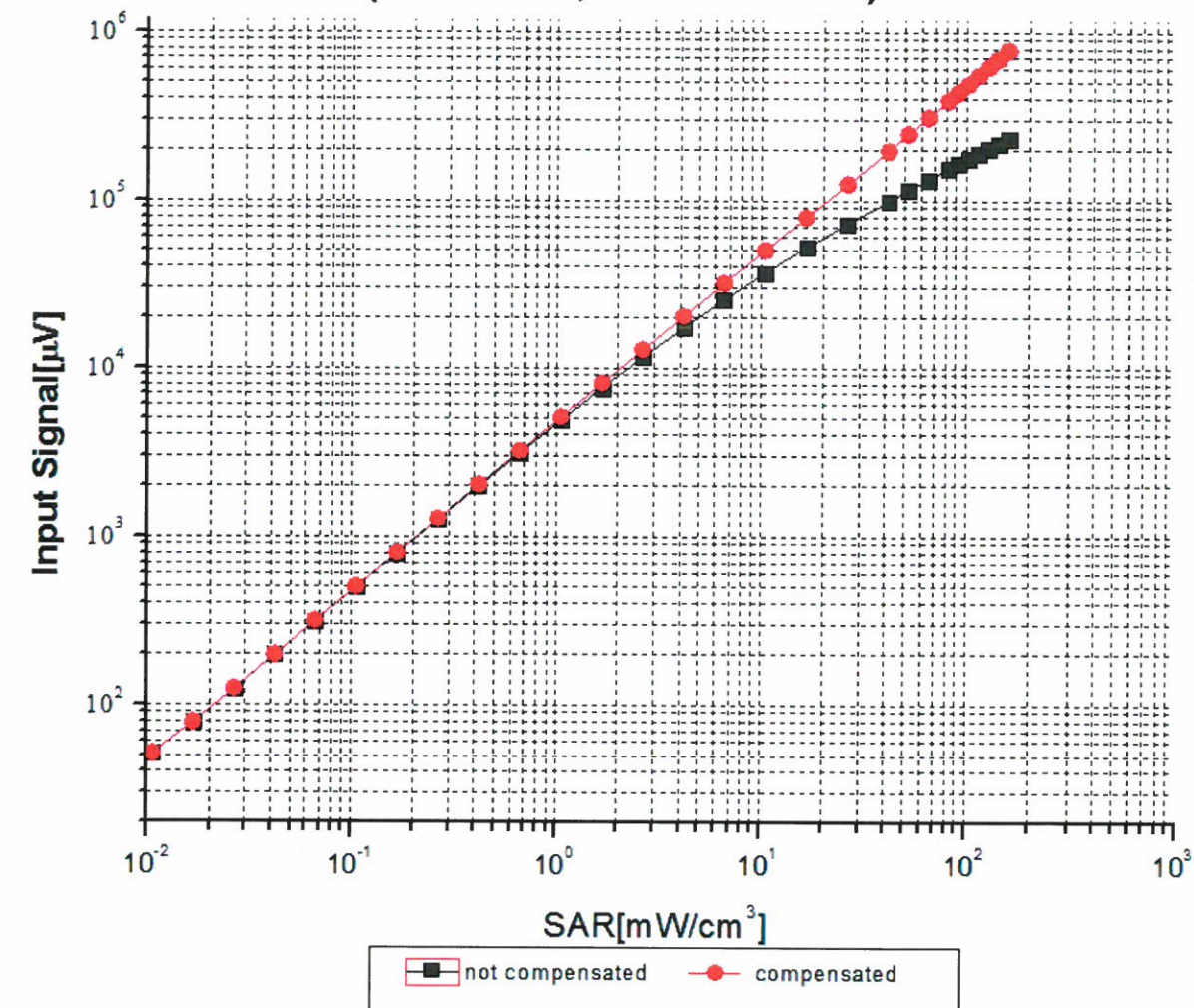
Uncertainty of Axial Isotropy Assessment: $\pm 0.9\%$ ($k=2$)



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Dynamic Range f(SAR_{head}) (TEM cell, f = 900 MHz)



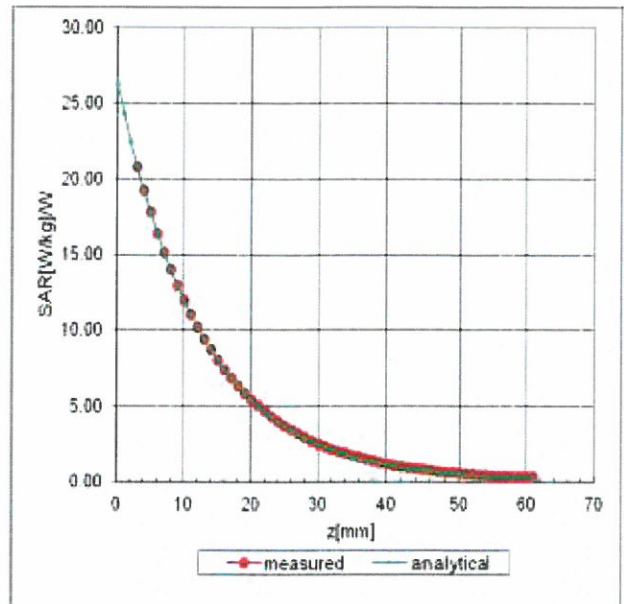
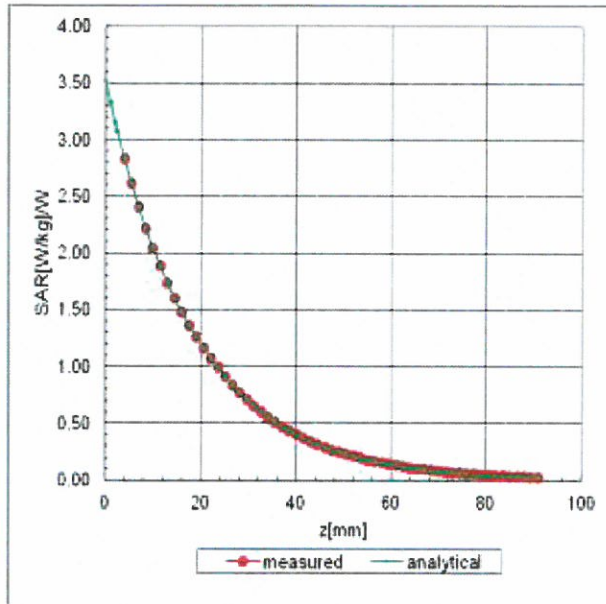
Uncertainty of Linearity Assessment: $\pm 0.9\%$ ($k=2$)



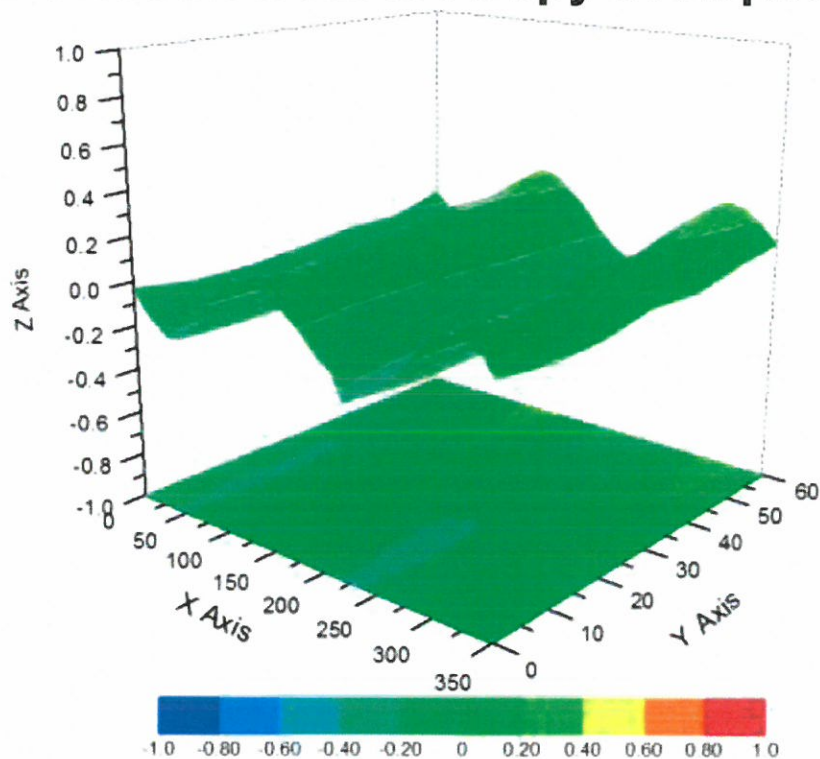
Conversion Factor Assessment

f=900 MHz, WGLS R9(H_convF)

f=1750 MHz, WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: $\pm 2.8\%$ (K=2)



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Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	15.3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm