



In Collaboration with

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CALIBRATION LABORATORY

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3962

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	10.37	10.37	10.37	0.40	0.85	± 12.1%
835	55.2	0.97	9.98	9.98	9.98	0.17	1.43	± 12.1%
1750	53.4	1.49	8.49	8.49	8.49	0.22	1.12	± 12.1%
1900	53.3	1.52	8.09	8.09	8.09	0.20	1.17	± 12.1%
2300	52.9	1.81	7.90	7.90	7.90	0.34	1.17	± 12.1%
2450	52.7	1.95	7.78	7.78	7.78	0.34	1.25	± 12.1%
2600	52.5	2.16	7.61	7.61	7.61	0.44	0.96	± 12.1%
5250	48.9	5.36	5.22	5.22	5.22	0.45	1.45	± 13.3%
5600	48.5	5.77	4.45	4.45	4.45	0.50	1.60	± 13.3%
5750	48.3	5.94	4.59	4.59	4.59	0.50	1.45	± 13.3%

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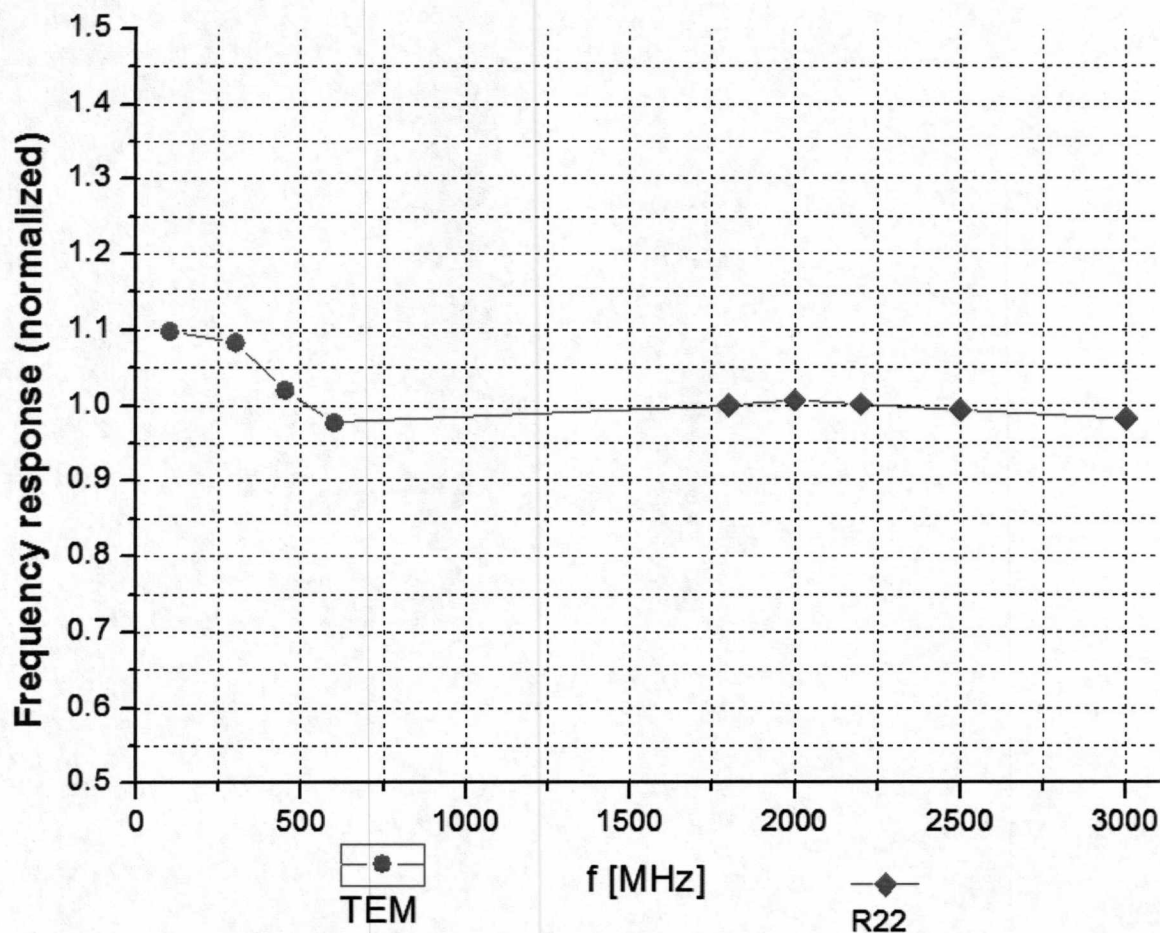
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Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: $\pm 7.4\%$ ($k=2$)

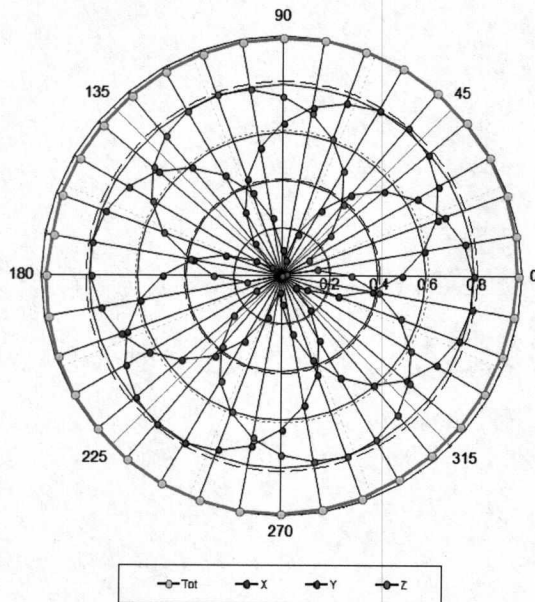


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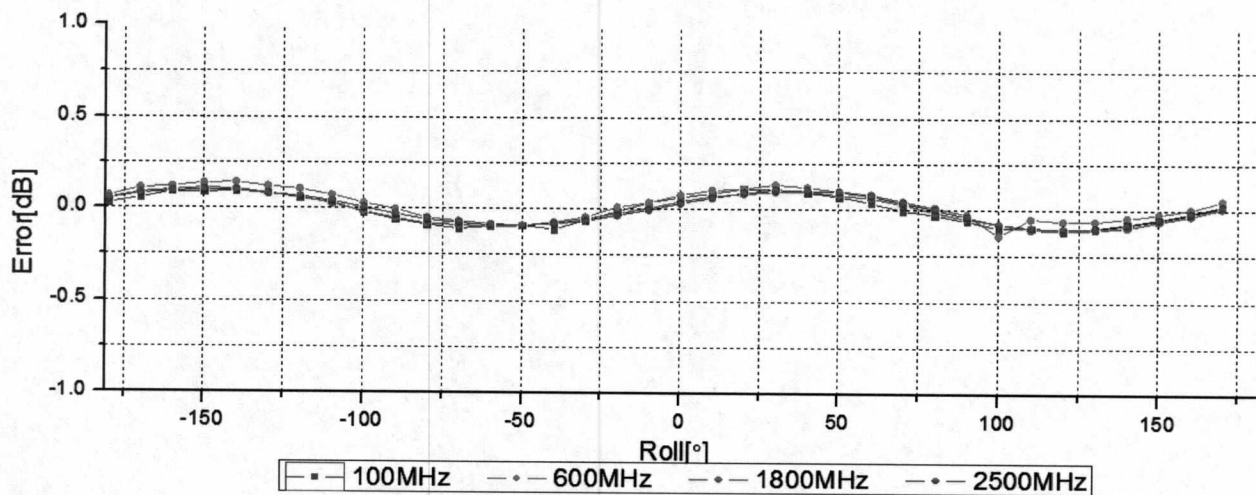
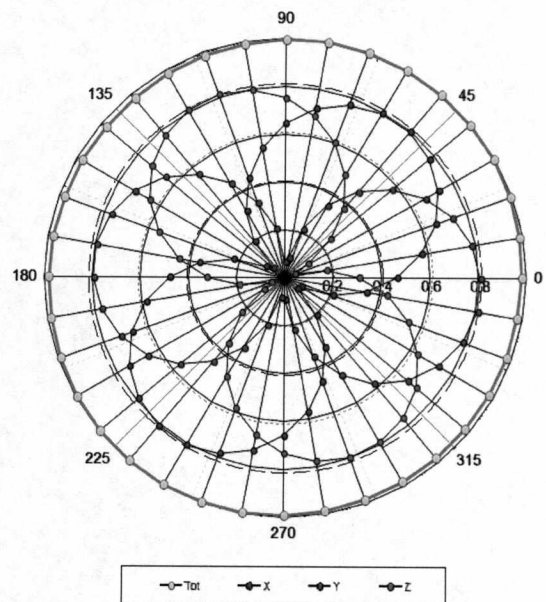
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Receiving Pattern (Φ), $\theta=0^\circ$

f=600 MHz, TEM



f=1800 MHz, R22

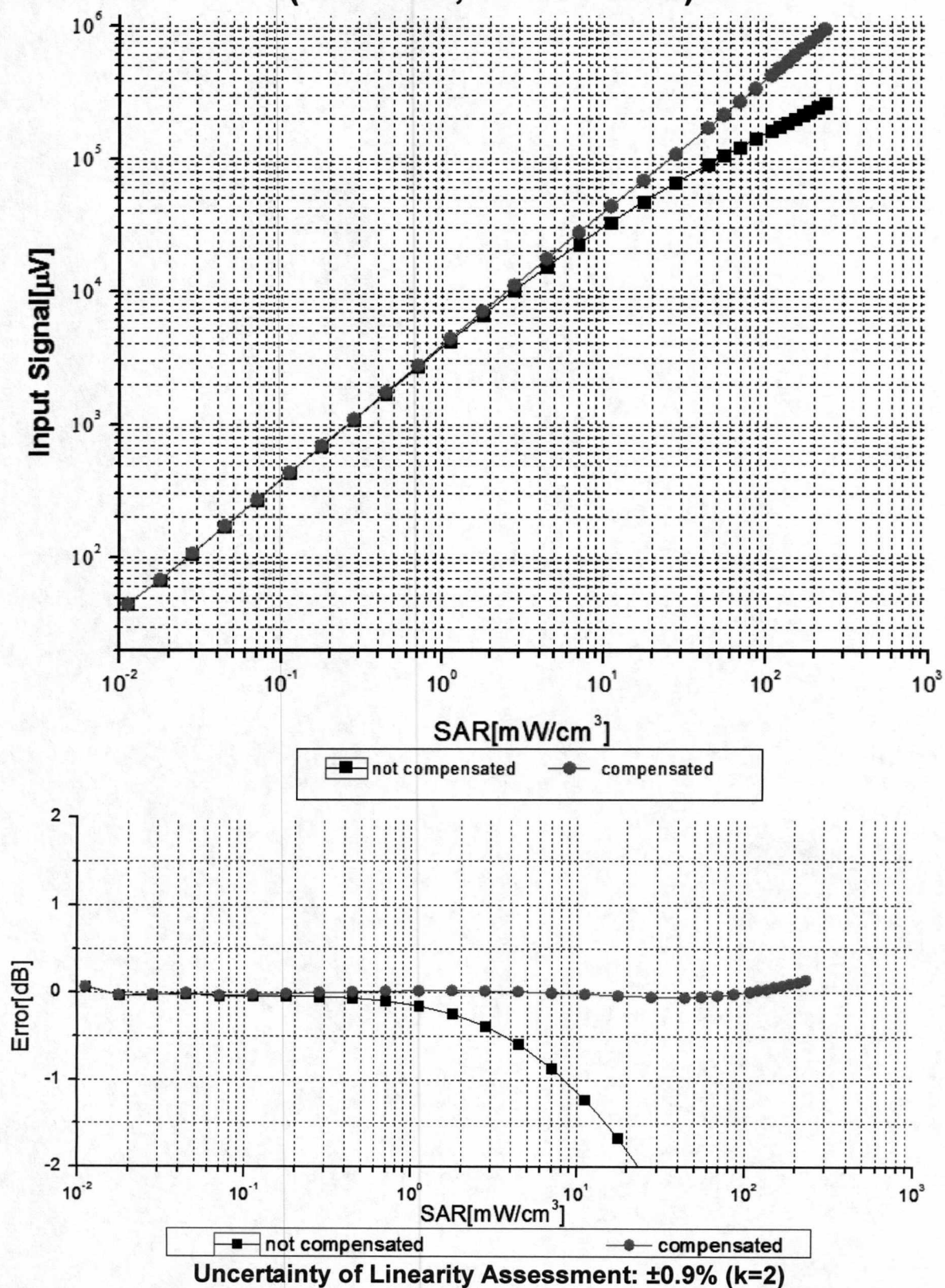


Uncertainty of Axial Isotropy Assessment: $\pm 1.2\%$ ($k=2$)



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





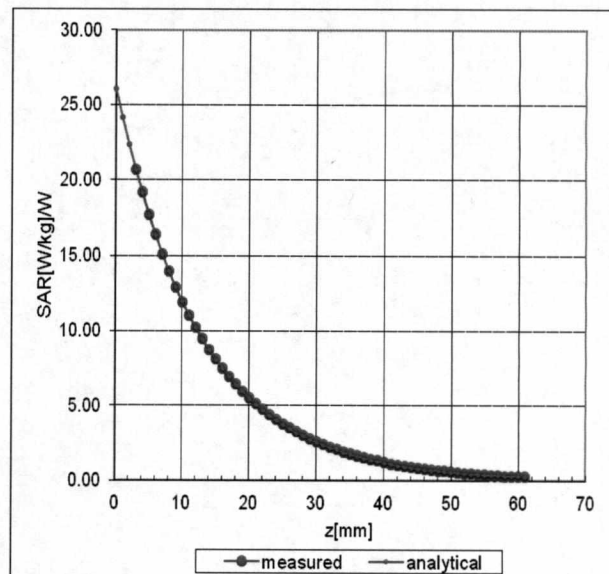
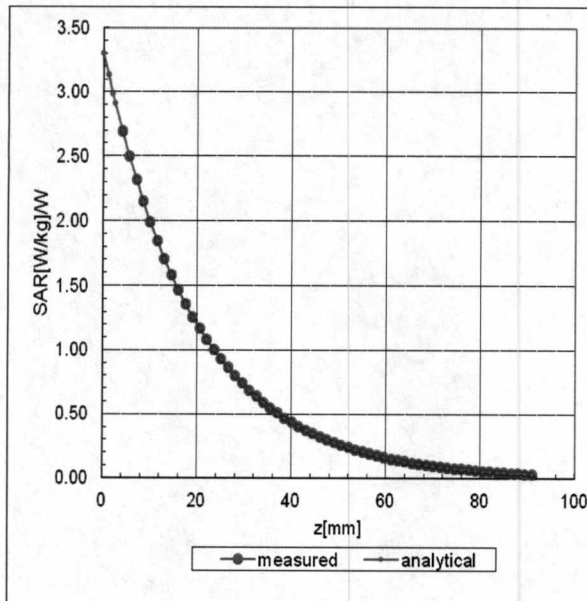
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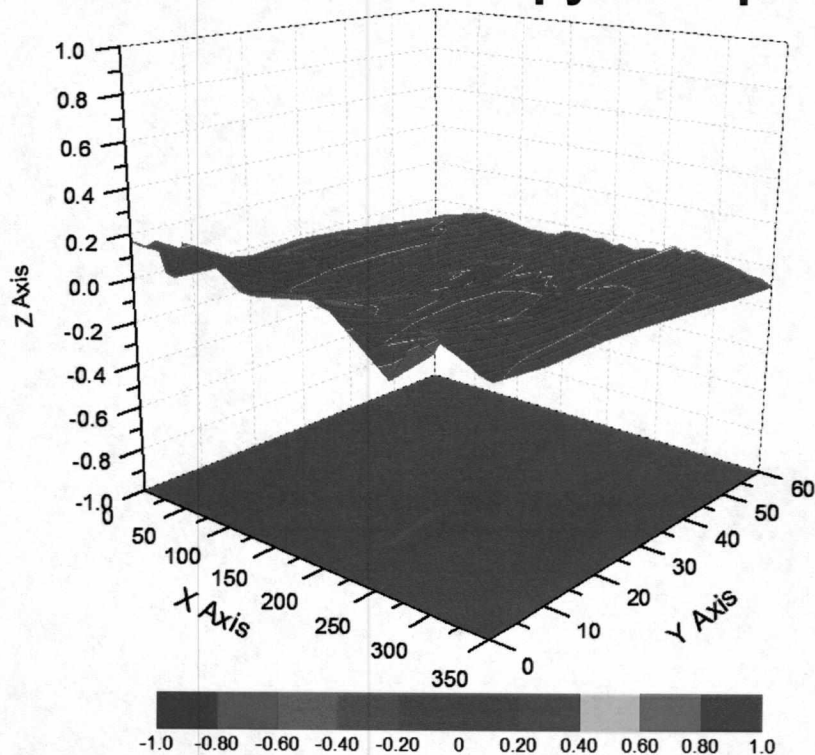
Conversion Factor Assessment

f=835 MHz, WGLS R9(H_convF)

f=1750 MHz, WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: $\pm 3.2\%$ (K=2)



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Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	152.2
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

Dipole D2450V2 SN 733				
Head Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
2016-12-07	-26.3	/	52.9	/
2017-12-06	-27.5	4.56%	56.1	3.2 Ω
Body Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
2016-12-07	-24.6	/	49.7	/
2017-12-06	-25.3	2.85%	51.8	2.1 Ω

Dipole D5GHzV2 SN 1165				
5750MHz Head Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
2016-12-13	-27.6	/	52.4	/
2017-12-12	-28.5	3.26%	54.1	1.7 Ω
5750MHz Body Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
2016-12-13	-26.4	/	53.3	/
2017-12-12	-27.1	2.65%	55.9	2.6 Ω