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LD/SEMC/BGUG/NM Ramadan Plicanic		GUG/N 03:174		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGUG/NMC Mats Hansson	030617	030617	A	File

SAR Test Report: PY7A1021031

Date of test: June 5 and 10, 2003

Laboratory:
Electromagnetic Near Field and Radio Frequency Dosimetry Lab
Sonyericsson Mobile Communications AB
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SE-221 82 LUND, Sweden

Test Responsible:
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Statement of Compliance

Sony Ericsson Mobile Communications AB declares under its sole responsibility that the product

Sony Ericsson Type AAB-1021031-BV ; FCC ID: PY7A1021031

to which this declaration relates, is in conformity with the appropriate RF exposure standards recommendations and guidelines. It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

(None)

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2 Introduction

In this test report, compliance of the Sony Ericsson PY7A1021031 portable telephone with RF safety guidelines is demonstrated. The applicable RF safety guidelines and the SAR measurement specifications used for the test are described in the *SAR Measurement Specifications of Wireless Handsets* [1].

3 Device Under Test

3.1 Antenna Description

Type	Internal antenna	
Location	Inside the over flip, near the top	
Dimensions	Max length	38mm
	Max width	14mm
Configuration	PIFA	

3.2 Device description

Device model	Z600
Serial number	182
Mode	GSM 1900
Multiple Access Scheme	TDMA
Maximum Output Power Setting	29.7dBm
Factory Tolerance in Power Setting	± 0.3dB
Maximum Peak Output Power	30.0dBm
Crest Factor	8
Transmitting Frequency Range	1850.2 – 1909.8 MHz
Prototype or Production Unit	Preproduction
Device Category	Portable
RF exposure environment	General population / uncontrolled

4 Test equipment

4.1 Dosimetric system

SAR measurements were made using the DASY3 professional system (software version 3.1c) with SAM twin phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The list of calibrated equipment is given below.

Description	***Serial Number***	***Due Date***
DASY3 DAE V1	428	4/2004
E-field probe ETDV6	1585	4/2004
Dipole Validation Kit, D1900 V2	5d002	2/2006

4.2 Additional equipment

Description	***Inventory Number***	***Due Date***
Signal generator ESG-D4000A	INV 462935	9/2003
Directional coupler HP778D	INV 2903	1/2004
Power meter R&S NRVD	INV 483920	1/2004
Power sensor R&S NRV-Z5	INV 2333	1/2004
Power sensor R&S NRV-Z5	INV 2334	1/2004
Termination 65N50-0-11	INV 2903	1/2004
Network analyzer HP8753C	INV421671	8/2003
S-parameter test set HP85047A	INV 421670	8/2003
Dielectric probe kit HP8507D	INV 20000053	2/2004
Wavetek STABILOK 4031D	INV 421578	7/2003

5 Electrical parameters on the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ε_r, and the conductivity, σ, of the tissue simulating liquids were measured with the dielectric probe kit. These values are shown in the table below. The mass density, ρ, entered into the DASY3 software is also given. Recommended limits for permittivity ε_r, conductivity σ and mass density ρ are also shown.

f (MHz)	**Tissue type**	**Limits / Measured**	**Dielectric Parameters**		
			ε_r	σ (S/m)	ρ (g/cm³)
1900	**Head**	**Measured, 06/05/03**	38.2	1.45	1.0
		Recommended	40.0	1.4	1.0
	Muscle	**Measured, 06/10/03**	50.8	1.45	1.0
		Recommended	53.3	1.52	1.0

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6 System accuracy verification

A system accuracy verification of the DASY3 was performed using the dipole validation kit listed in section 3.1. The system verification test was conducted on the same day as the measurement of the DUT. Measurement made in ambient temperature 23.2 °C and humanity 43.5%. The obtained results are displayed in the table below.

RF noise had been measured in liquid when all RF equipment in lab was set off. Measured value was 0.0013 mW/g in 1g mass.

f (MHz)	Tissue type	Measured / Reference	SAR (W/kg) 1g mass	Dielectric Parameters			t (°C)
				ε_r	σ (S/m)	ρ (g/cm³)	
1900	Head	**Measured, 06/05/03**	43.0	38.2	1.45	1.0	21.0
		Reference	41.6	38.8	1.44	1.0	-
	Muscle	**Measured, 06/10/03**	43.6	51.0	1.54	1.0	23.1
		Reference	43.2	51.2	1.59	1.0	-

7 SAR measurement uncertainty

Error description	Uncertainty (%)	Distribution	Divisor	c_i 1g	Standard Uncertainty Head	Standard Uncertainty Body
Measurement system						
Probe calibration	±4.4	Normal	1	1	±4.4	±4.4
Axial isotropy	±4.7	Rectangular	√3	$(1-c_p)^{1/2}$	±1.9	±1.9
Spherical isotropy	±9.6	Rectangular	√3	$(c_p)^{1/2}$	±3.9	±3.9
Spatial resolution	±0.0	Rectangular	√3	1	±0.0	±0.0
Boundary effects	±5.5	Rectangular	√3	1	±3.2	±3.2
Probe linearity	±4.7	Rectangular	√3	1	±2.7	±2.7
Detection limit	±1.0	Rectangular	√3	1	±0.6	±0.6
Readout electronics	±1.0	Normal	1	1	±1.0	±1.0
Response time	±0.8	Rectangular	√3	1	±0.5	±0.5
Integration time	±1.4	Rectangular	√3	1	±0.8	±0.8
RF ambient conditions	±3.0	Rectangular	√3	1	±1.7	±1.7
Mech. Constraints of robot	±0.4	Rectangular	√3	1	±0.2	±0.2
Probe positioning	±2.9	Rectangular	√3	1	±1.7	±1.7
Extrap. and integration	±3.9	Rectangular	√3	1	±2.3	±2.3
					±8.3	**±8.3**
Test sample related						
Device positioning	±6.0	Normal	0.89	1	±6.7	±6.7
Device holder	±5.0	Normal	0.84	1	±5.9	±5.9
Power drift	±2.0	Rectangular	√3	1	±1.6	±1.6
					±9.1	**±9.1**
Phantom and setup						
Phantom uncertainty	±4.0	Rectangular	√3	1	±2.3	±2.3
Liquid conductivity (target)	±5.0	Rectangular	√3	0.6	±1.7	±1.7
Liquid conductivity (meas)	-1.4/-4.6	Rectangular	√3	0.6	±0.5	±1.6
Liquid permittivity (target)	±5.0	Rectangular	√3	0.6	±1.7	±1.7
Liquid permittivity (meas)	-1.8/-4.7	Rectangular	√3	0.6	±0.6	±1.6
					±3.4	**±4.0**
Combined standard uncertainty					***±12.8***	***±13.0***
Extended standard uncertainty(k=2)					***±25.6***	***±26.0***

8 Test results

The measured 1-gram averaged SAR values of the device against the head and the body are provided in Tables 1 and 2 respectively. The humidity and ambient temperature of test facility were 44.4% - 40.8% and 22.2 °C – 24.8 °C respectively. The depth of the head tissue simulating liquid was 15.1cm and of the muscle tissue simulating liquid was 15.5cm. A base station simulator was used to control the device during the SAR measurement. The phone was supplied with full-charged battery for each measurement.

For head measurement, the device was tested on the right-hand phantom (corresponding to the right side of the head) and the left-hand phantom in two phone position, cheek (touch) and tilt (cheek + 15deg). For GSM 1900 modes, the device was tested at the lowest, middle and highest frequencies in the transmit band. On position and frequency when find max SAR values had been measured SAR with BT ON. Phone had been pared with Sony Ericsson HBH-60 hand free set. Result are provided in table1, row “Cheek + BT”.

Mode	Channel	Peak Output Power (dBm)	Phone Position	Liquid temp(°C)	SAR (W/kg) in 1g mass	
					Right-hand	Left-hand
1900 GSM	512	29.8	**Cheek**	20.3/20.5	0.31	0.23
			Tilt	20.5/20.8	0.31	0.14
	661	29.8	**Cheek**	20.3/20.6	0.35	0.27
			Tilt	20.5/20.8	0.30	0.16
	810	29.5	**Cheek**	20.4/20.7	**0.39**	0.29
			Cheek+BT	20.8	0.38	
			Tilt	20.4/20.7	**0.32**	0.17

Table1: SAR measurement result for Sony Ericsson PY7A1021031 telephone. Measured against the head.

For body-worn measurements, the device was tested against flat phantom representing the user body. Under measurement phone was put on 15mm from the flat phantom and measurement provides for both front and back part the phone to the phantom.

Mode	Channel	Peak Output Power(dBm)	Phone Position	Liquid temp(°C)	SAR(W/kg) in 1g mass
1900 GSM	512	29.8	**Ant to Ph**	20.4	0.56
			Back	20.5	0.05
	661	29.8	**Ant to Ph**	20.4	0.80
			Back	20.6	0.07
	810	29.5	**Ant to Ph**	20.5	**0.84**
			Back	20.6	0.08

Table 2: SAR measurement result for Sony Ericsson PY7A1021031 telephone. Measured against the body.

9 References

[1] R.Plicanic, “SAR Measurement Specification of Wireless Handsets”, Sony Ericsson internal document LD/SEMC/GUG/N 03:141

[2] FCC, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radio Frequency Emissions,” Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01).

[3] IEEE, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wirelles Communications Devices: Experimental Techniques,” Std 1528-200x, Draft 6.5 – August 20, 2001.

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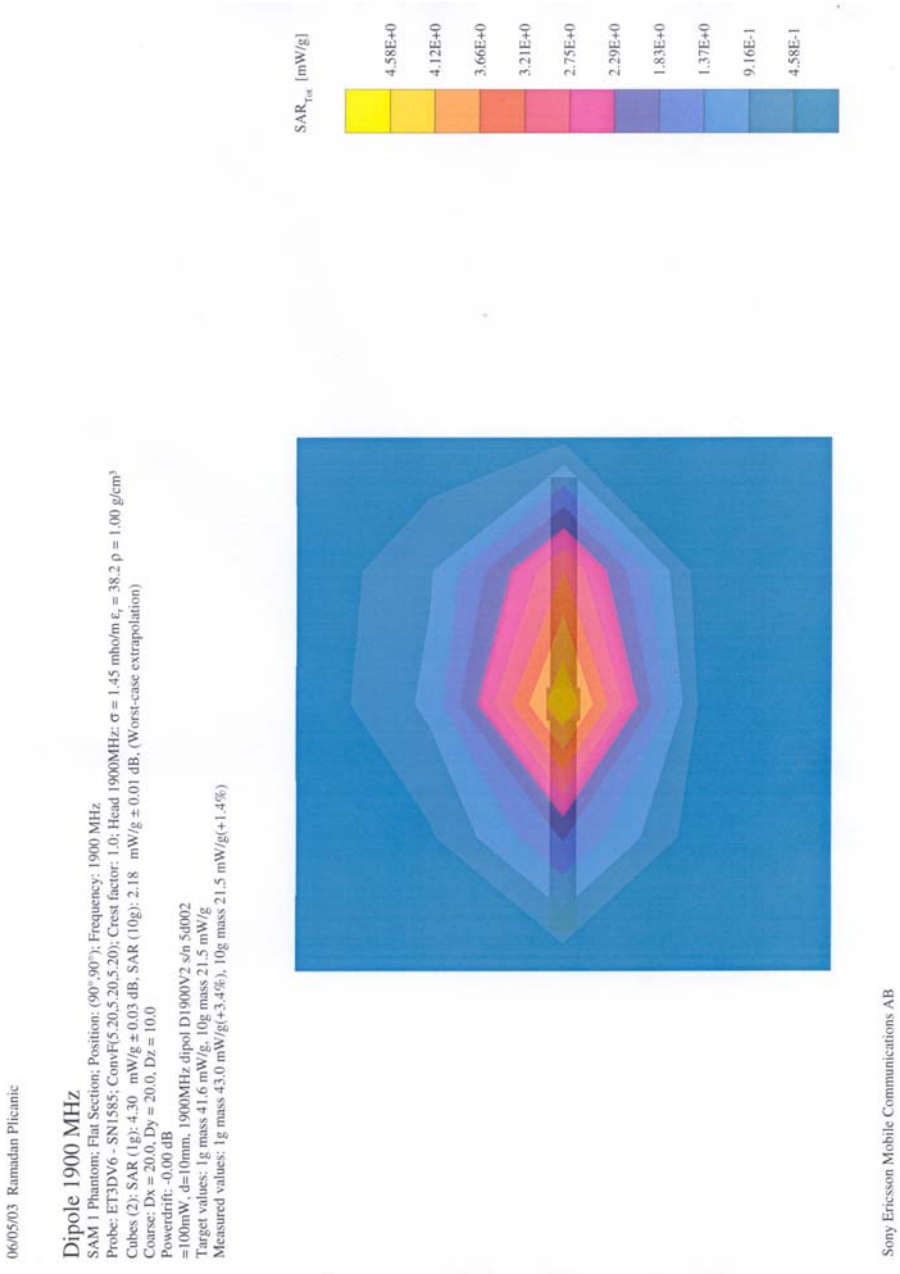
10 Appendix

10.1 SAR distribution comparison for system accuracy verification



Validation Dipole, measured with head simulating tissue on 06/06/03

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Date/Time: 04/09/03 18:49:39

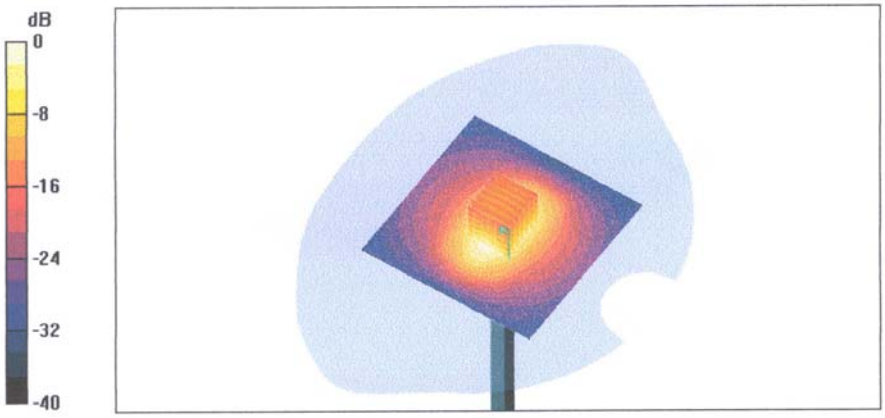
Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN5d002_SN1507_HSL1900_090403.da4

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN5d002
Program: Dipole Calibration

Communication System: CW-1900; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL 1900 MHz (σ = 1.44 mho/m, ε_r = 38.78, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1507; ConvF(5.2, 5.2, 5.2); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.2 V/m
Peak SAR = 18.2 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.38 mW/g
Power Drift = 0.01 dB



1900MHz SAR distribution of validation dipole from reference measurement with head simulating tissue

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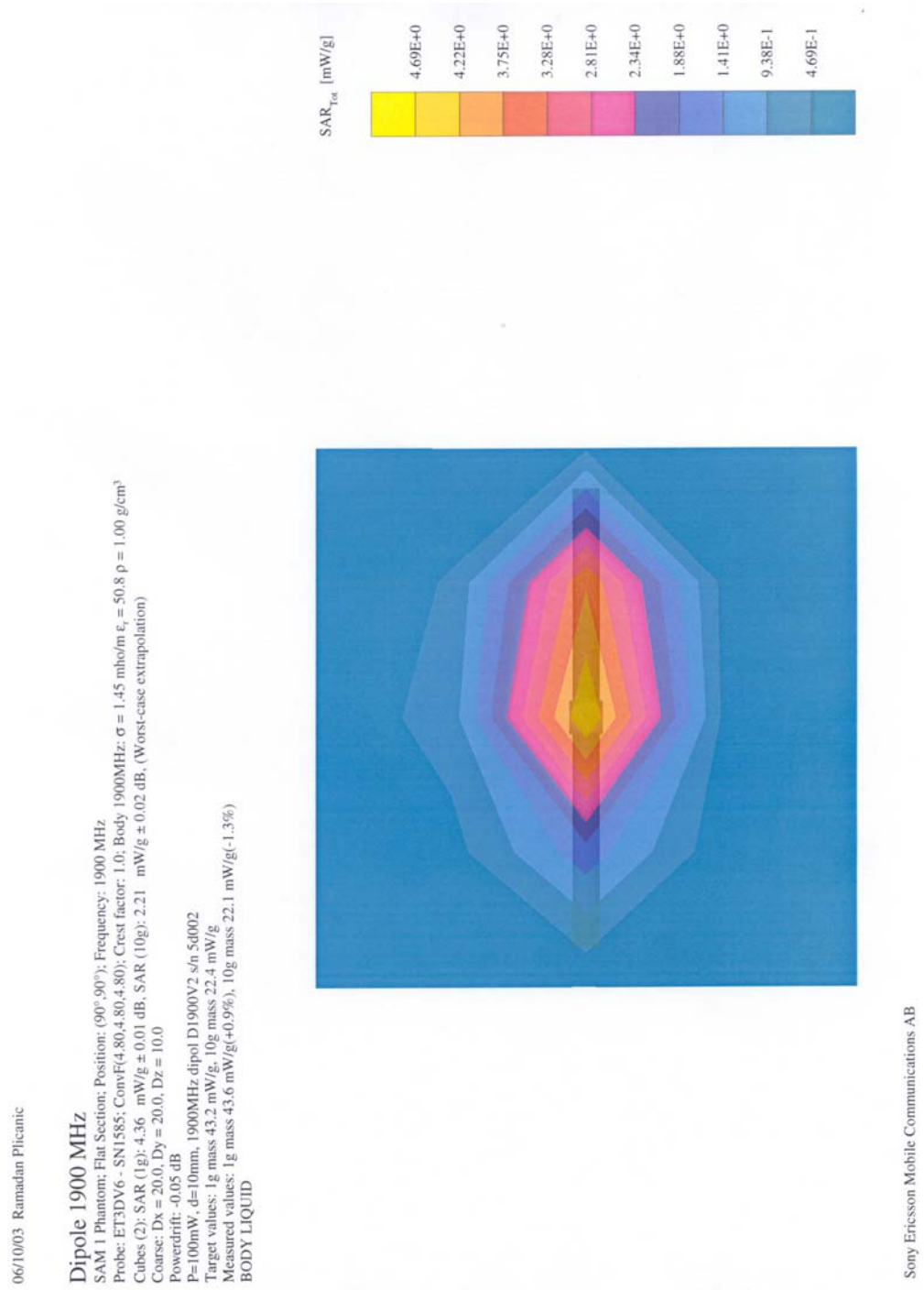

Validation Dipole, measured with muscle simulating tissue on 06/10/03

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Date/Time: 04/08/03 12:31:50

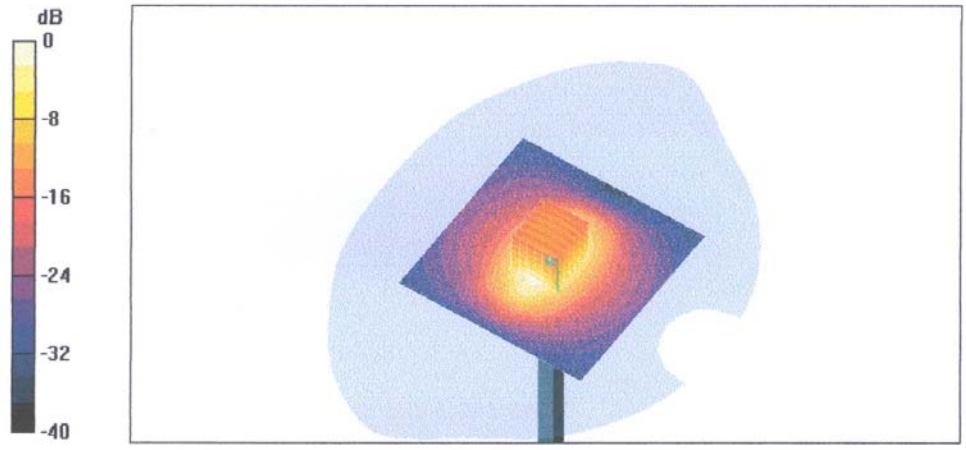
Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN5d002_SN1507_M1900_080403.da4

DUT: Dipole 1900 MHz; Serial: D1900V2 - SN5d002
Program: Dipole Calibration

Communication System: CW-1900; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: Muscle 1900 MHz; (σ = 1.59 mho/m, ε_r = 51.2, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1507; ConvF(4.8, 4.8, 4.8); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.8 V/m
Peak SAR = 18.9 W/kg
SAR(1 g) = 10.8 mW/g; SAR(10 g) = 5.6 mW/g
Power Drift = 0.02 dB



1900MHz SAR distribution of validation dipole from reference measurement with muscle simulating tissue

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10.2 SAR distribution plot

Distribution of max SAR in GSM1900 mode at ch810. Measured against the head for cheek phone position

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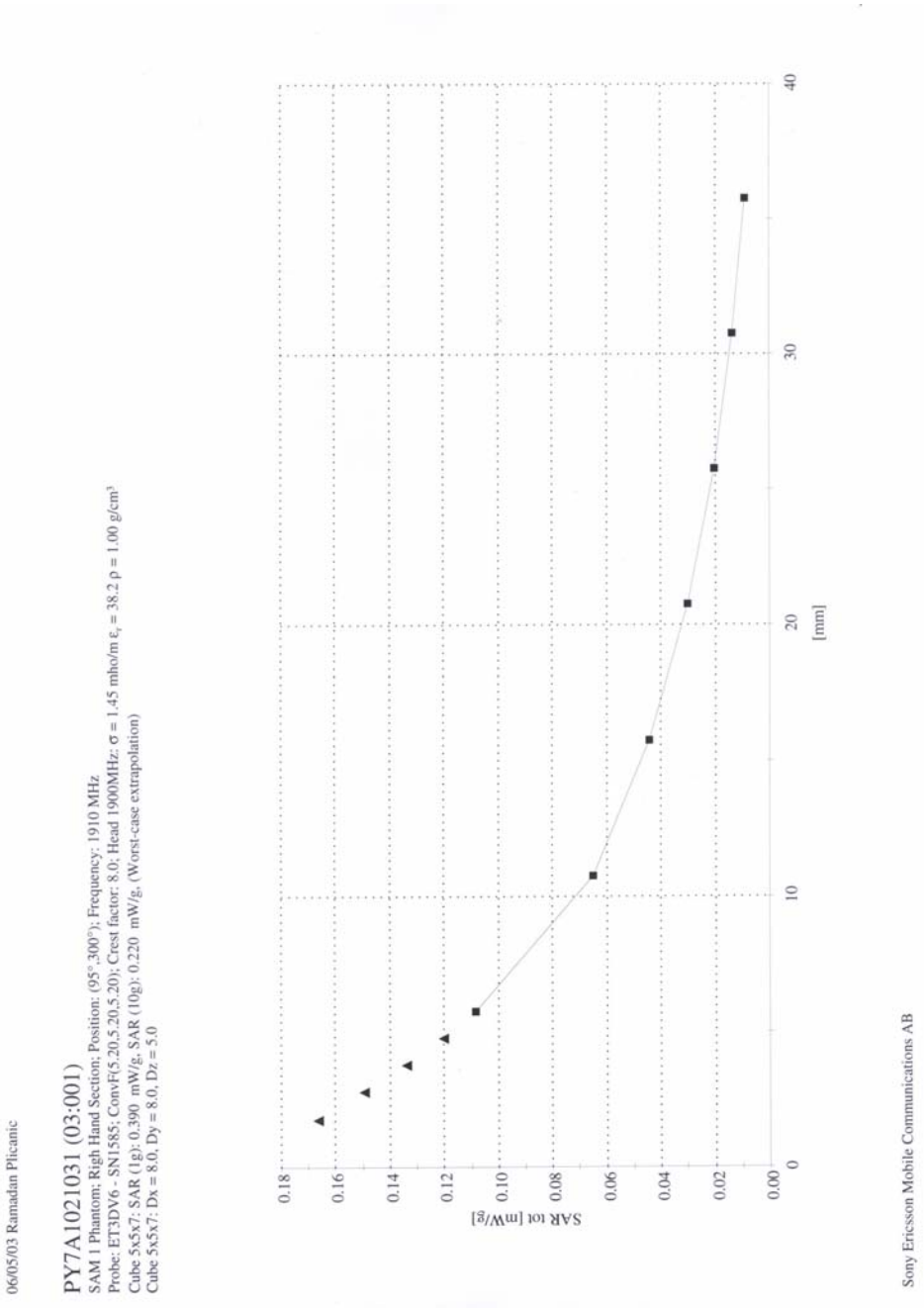

Z(x) distribution of max SAR in GSM1900 mode at ch810. Measured against the head for cheek phone position

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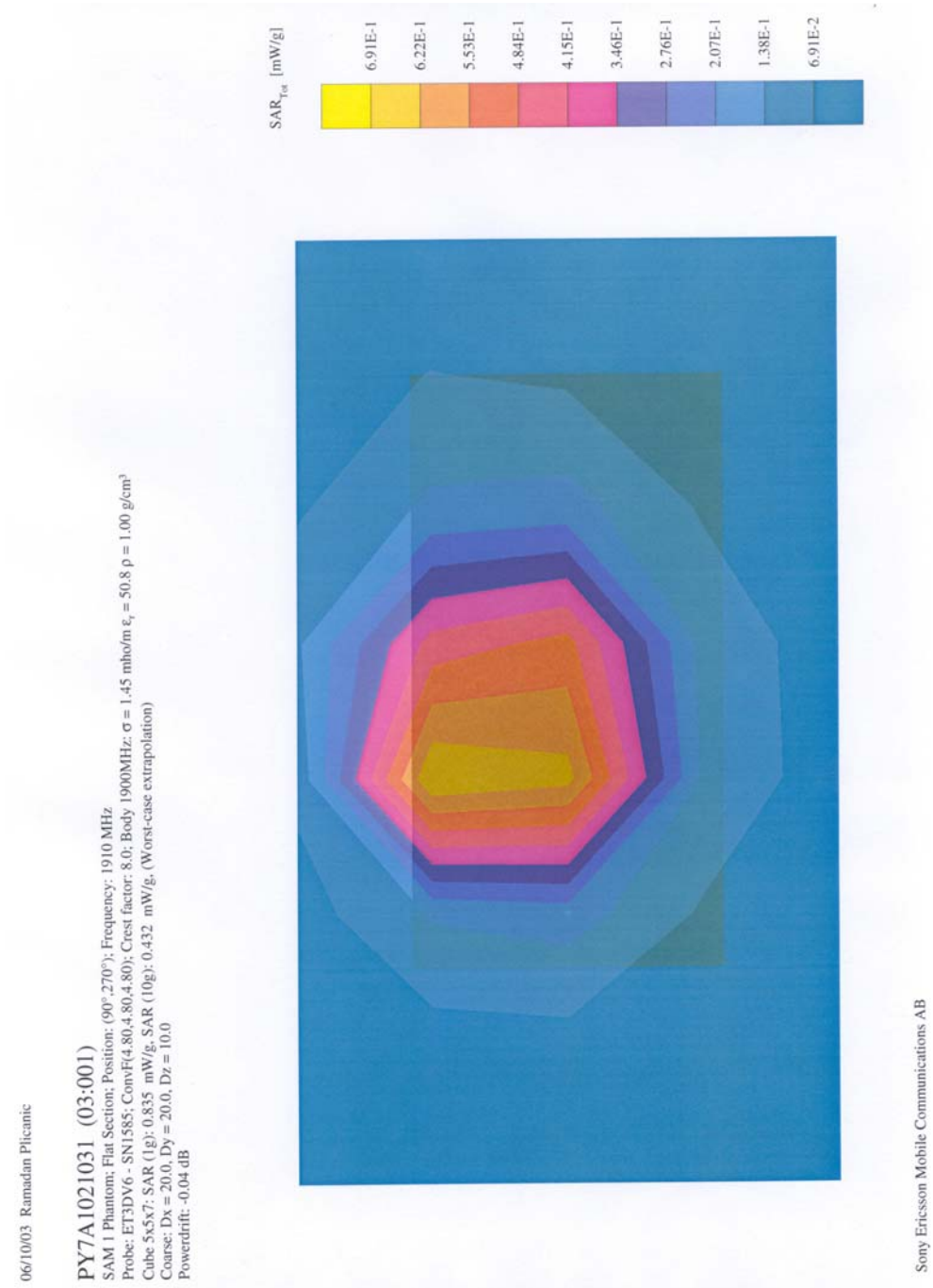

Distribution of max SAR in GSM1900 mode at ch810. Measured against the body for antenna part to the phantom position

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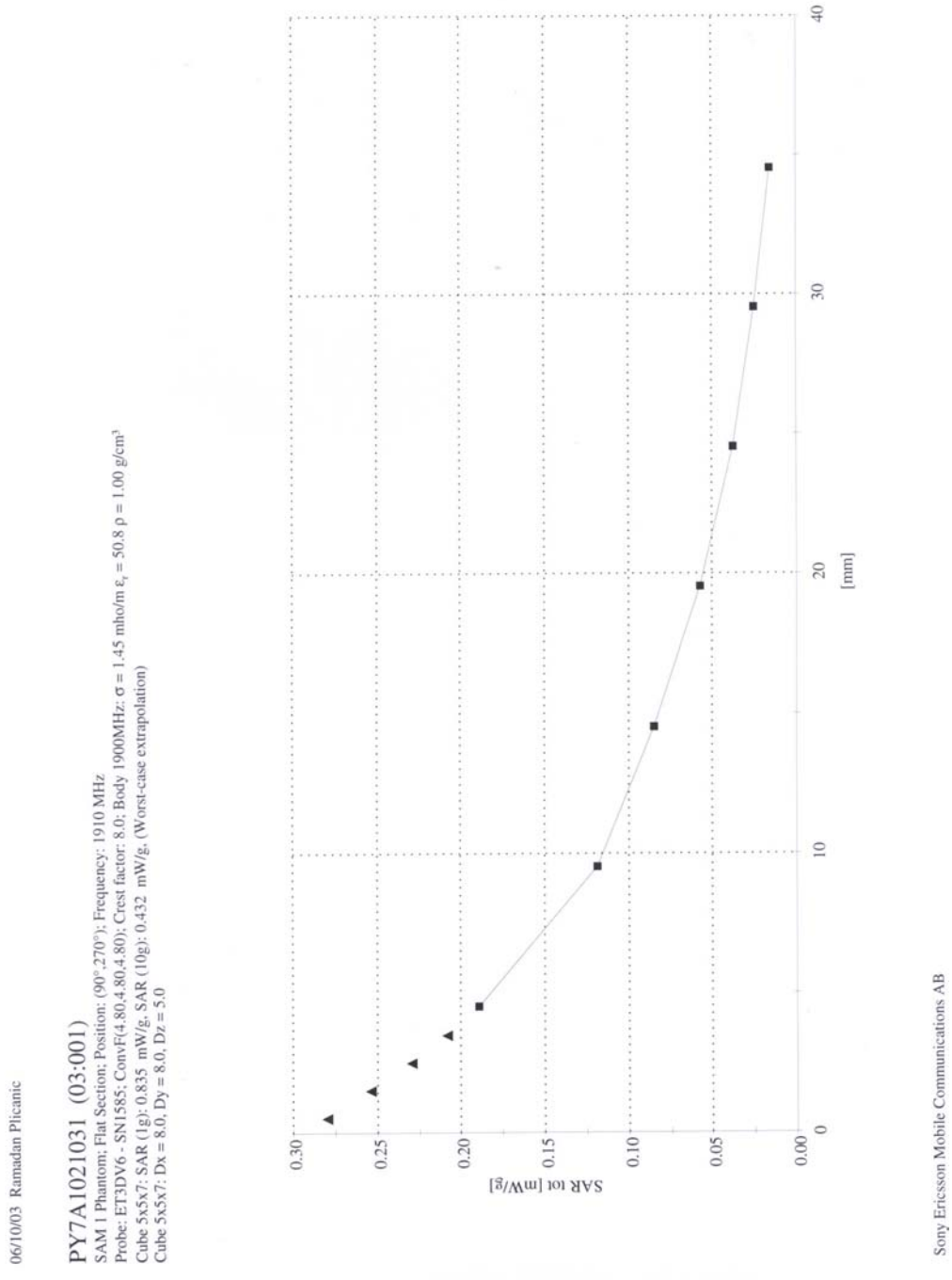

Z(x) distribution of max SAR in GSM1900 mode at ch810. Measured against the body

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10.3 Photographs of the device under test

Front side

Left side

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Back side

Battery

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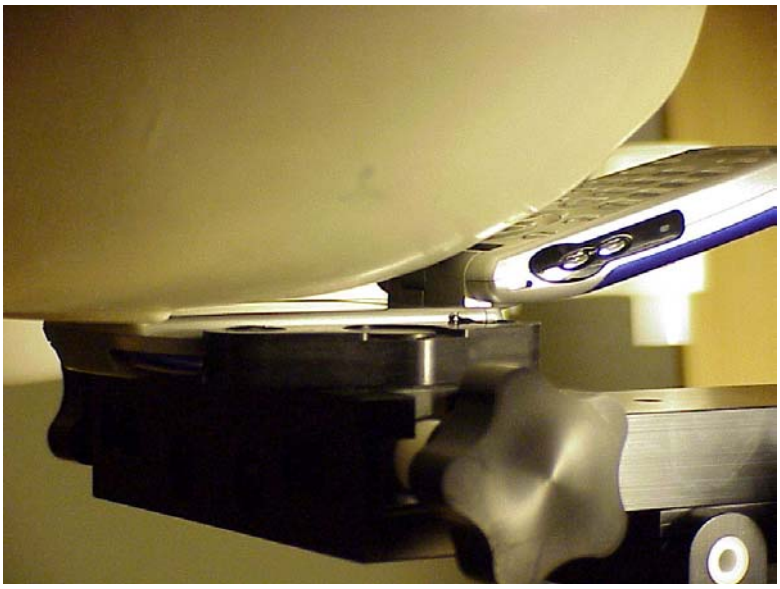
10.4 Device position on SAM Twins Phantom



Device position against the head: Cheek (touch) phone position

Device position against the head: Tilt (cheek+15deg) phone position

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Device position against the body: Phone on 15mm from the phantom

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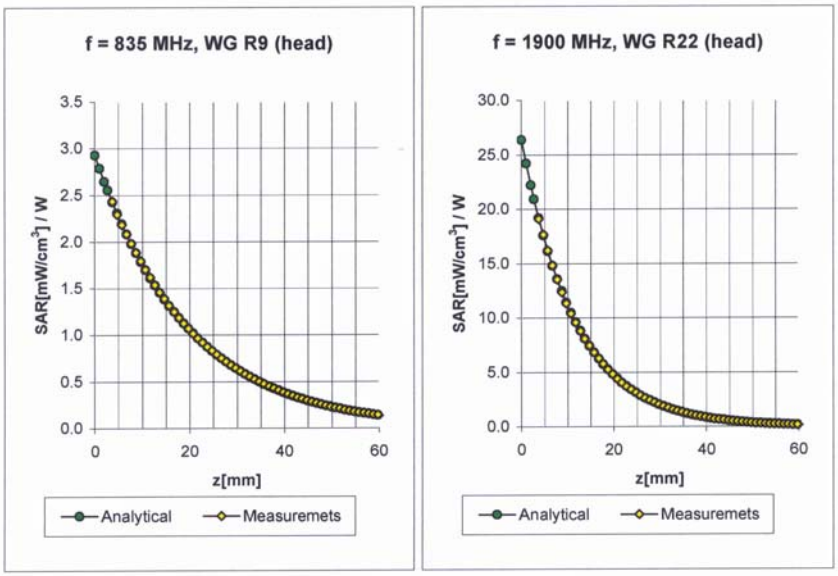
10.5 Probe calibration parameters

ET3DV6 SN:1585 **April 16, 2003**

Conversion Factor Assessment



Head **835 MHz** ε_r **= 41.5 ± 5%** σ **= 0.90 ± 5% mho/m**

ConvF X	**7.0** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**7.0** ± 8.9% (k=2)	Alpha	**0.35**
ConvF Z	**7.0** ± 8.9% (k=2)	Depth	**2.43**

Head **1900 MHz** ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

ConvF X	**5.2** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**5.2** ± 8.9% (k=2)	Alpha	**0.51**
ConvF Z	**5.2** ± 8.9% (k=2)	Depth	**2.53**

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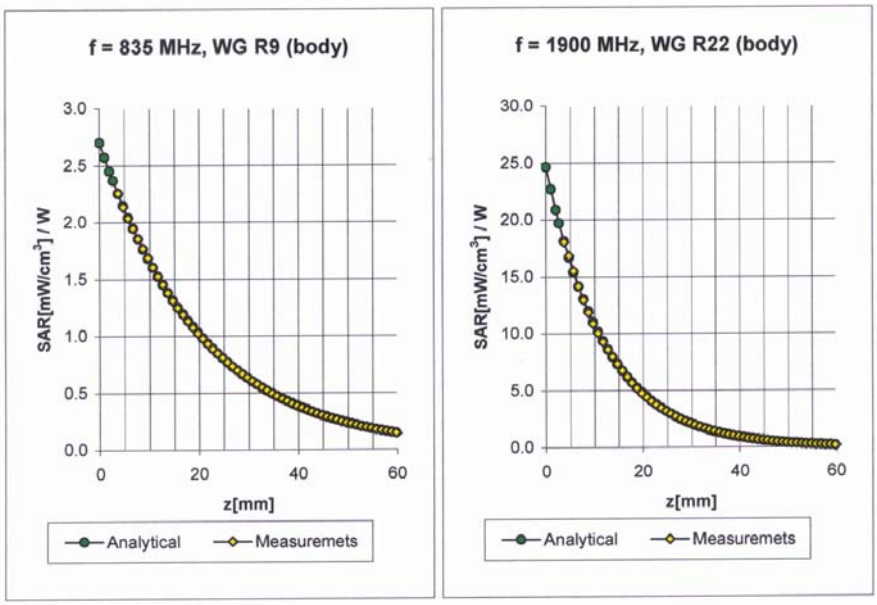
ET3DV6 SN:1585 **April 16, 2003**

Conversion Factor Assessment



Body **835 MHz** ε_r **= 55.2 ± 5%** σ **= 0.97 ± 5% mho/m**

Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**6.7** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.7** ± 9.5% (k=2)	Alpha	**0.34**
ConvF Z	**6.7** ± 9.5% (k=2)	Depth	**2.48**

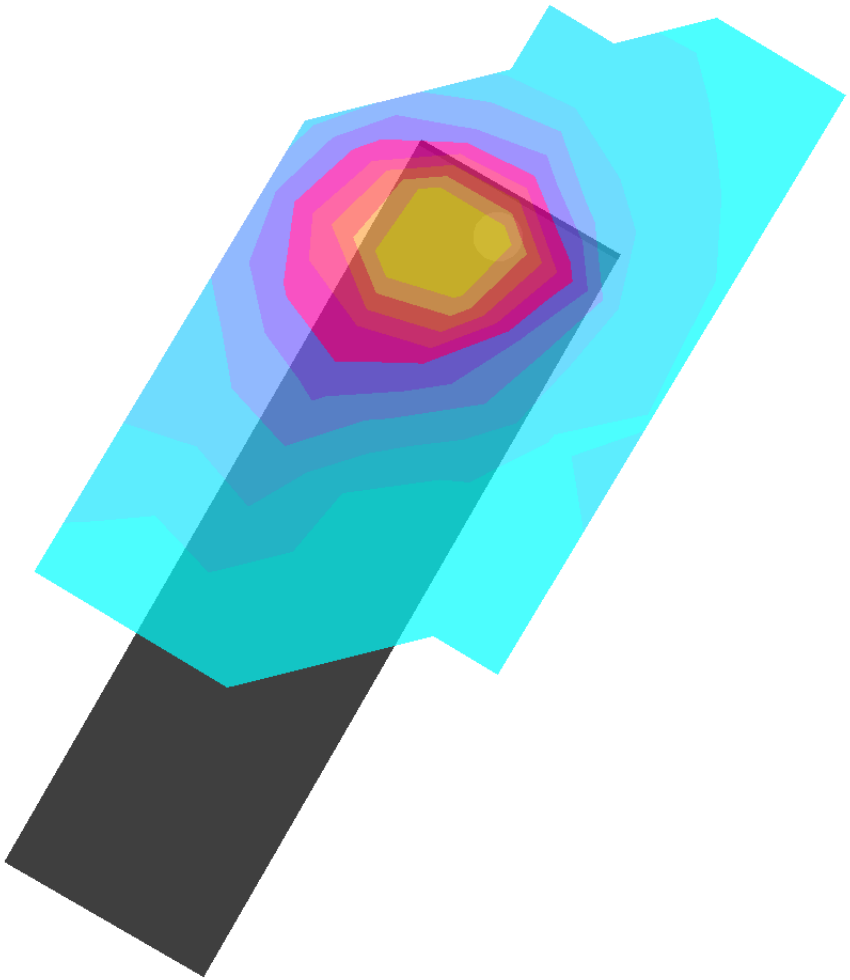
Body **1900 MHz** ε_r **= 53.3 ± 5%** σ **= 1.52 ± 5% mho/m**

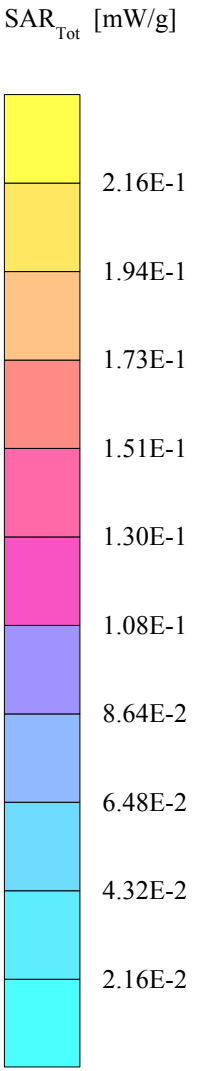
Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.8** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.8** ± 9.5% (k=2)	Alpha	**0.59**
ConvF Z	**4.8** ± 9.5% (k=2)	Depth	**2.55**

PY7A1021031 (03:001)

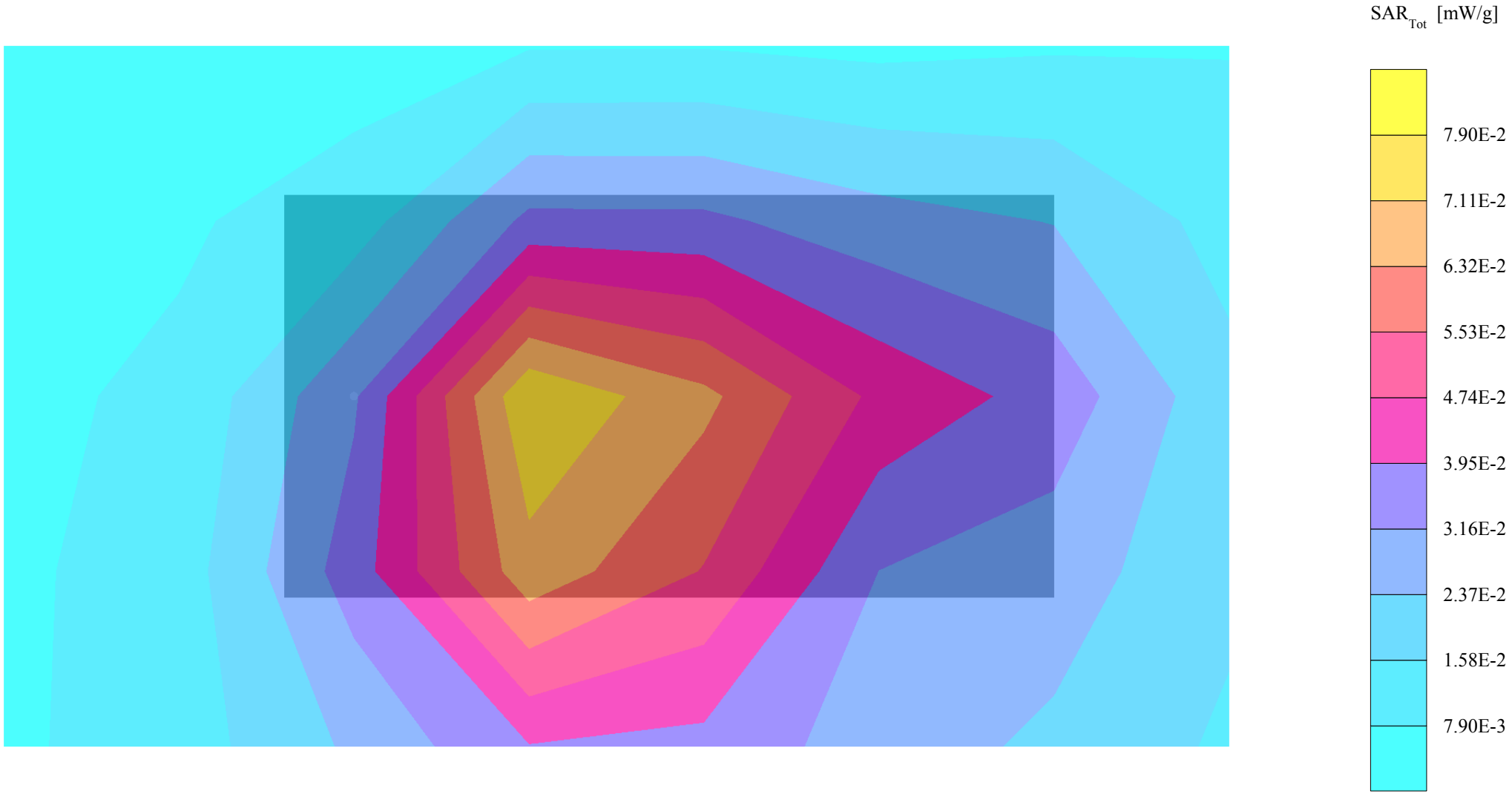
SAM 1 Phantom; Left Hand Section; Position: (95°,60°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1585; ConvF(5.40,5.40,5.40); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.233 mW/g, SAR (10g): 0.135 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.01 dB





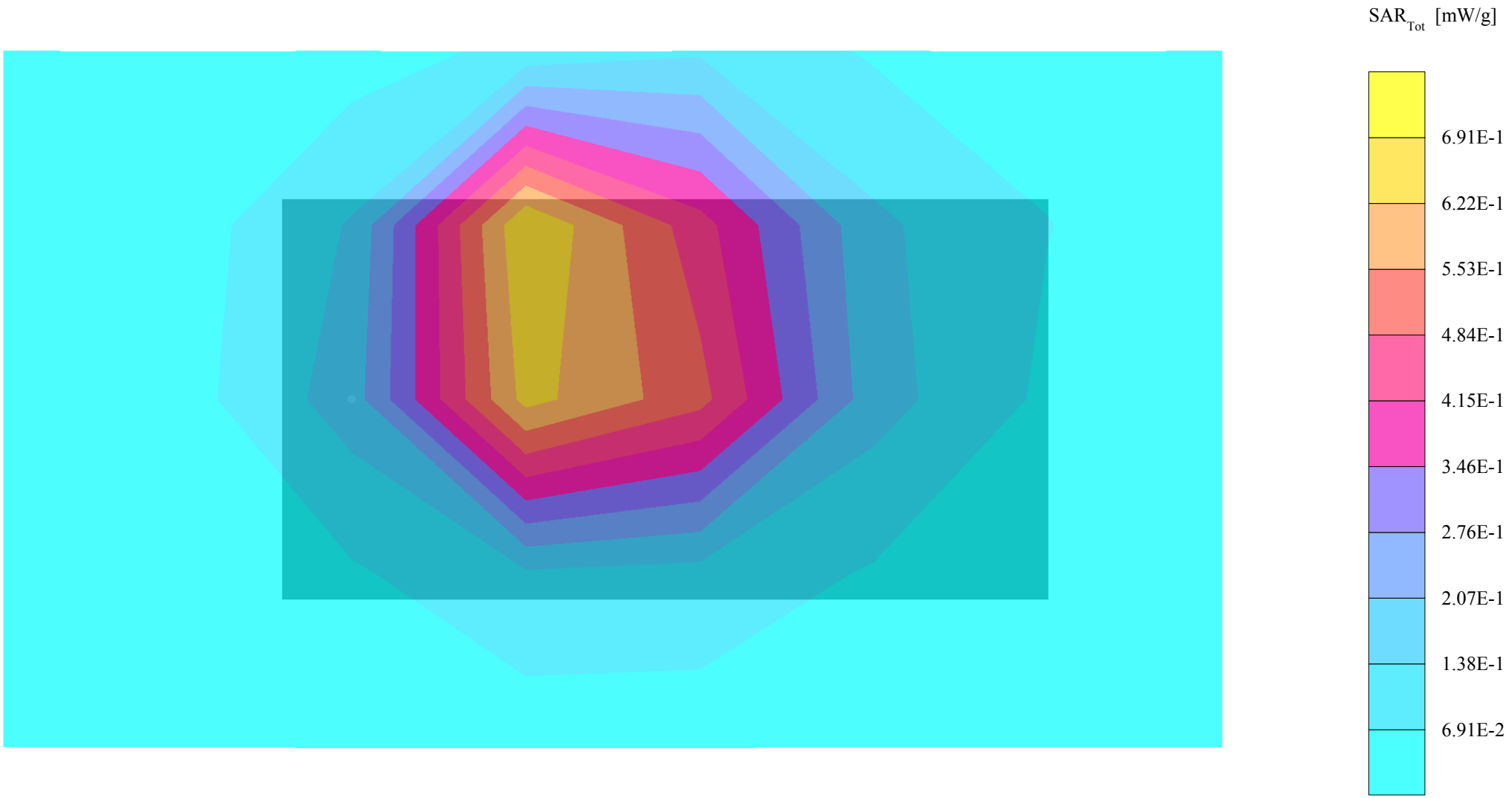
PY7A1021031 (03:001)

SAM 1 Phantom; Flat Section; Position: (90°,270°); Frequency: 1910 MHz
Probe: ET3DV6 - SN1585; ConvF(4.80,4.80,4.80); Crest factor: 8.0; Body 1900MHz: σ = 1.45 mho/m ε_r = 50.8 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.0774 mW/g, SAR (10g): 0.0470 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.02 dB



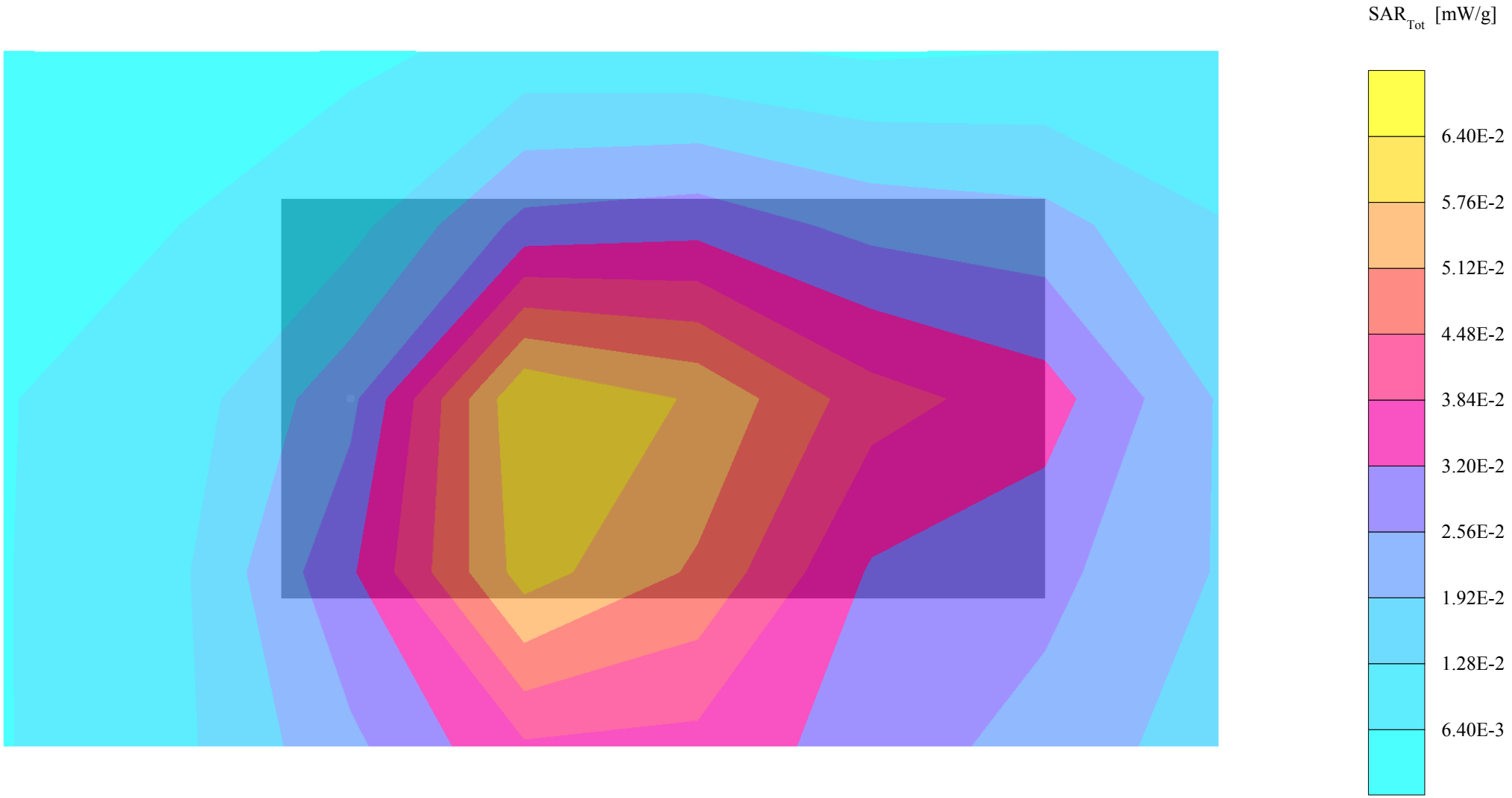
PY7A1021031 (03:001)

SAM 1 Phantom; Flat Section; Position: (90°,270°); Frequency: 1910 MHz
Probe: ET3DV6 - SN1585; ConvF(4.80,4.80,4.80); Crest factor: 8.0; Body 1900MHz: σ = 1.45 mho/m ε_r = 50.8 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.835 mW/g, SAR (10g): 0.432 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.04 dB



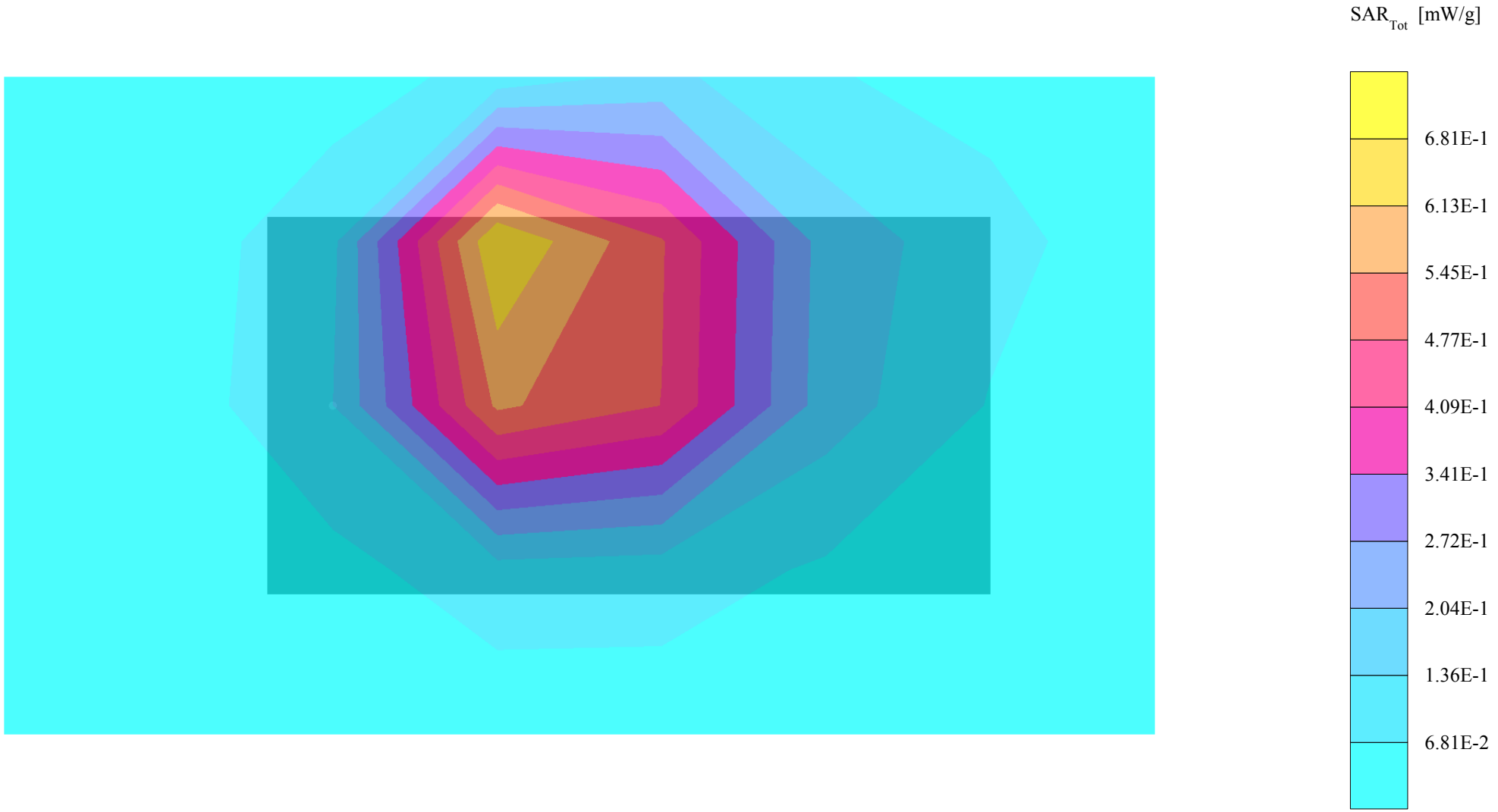
PY7A1021031 (03:001)

SAM 1 Phantom; Flat Section; Position: (90°,270°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1585; ConvF(4.80,4.80,4.80); Crest factor: 8.0; Body 1900MHz: σ = 1.45 mho/m ε_r = 50.8 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.0657 mW/g, SAR (10g): 0.0403 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.01 dB



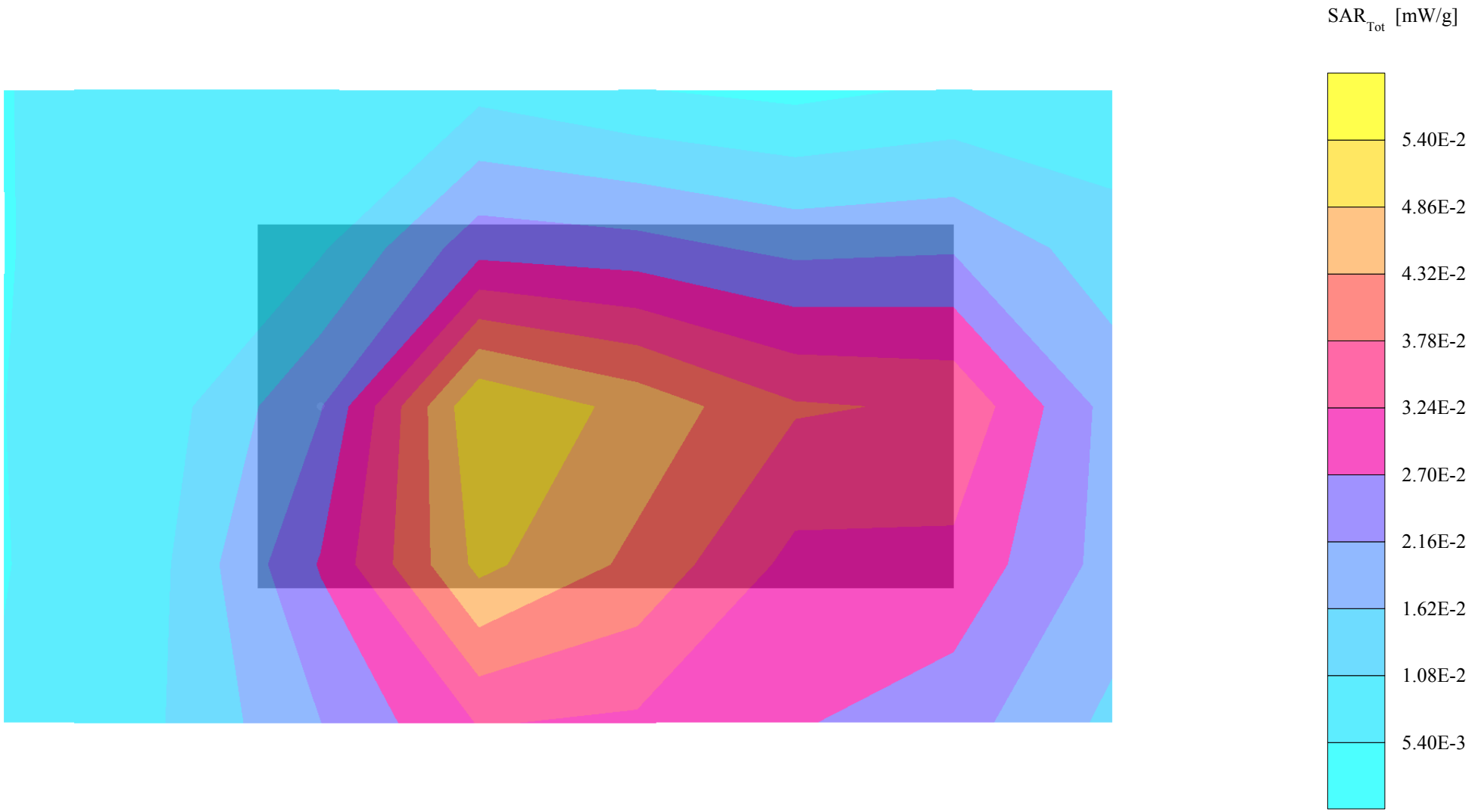
PY7A1021031 (03:001)

SAM 1 Phantom; Flat Section; Position: (90°,270°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1585; ConvF(4.80,4.80,4.80); Crest factor: 8.0; Body 1900MHz: σ = 1.45 mho/m ε_r = 50.8 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.799 mW/g, SAR (10g): 0.415 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: 0.03 dB



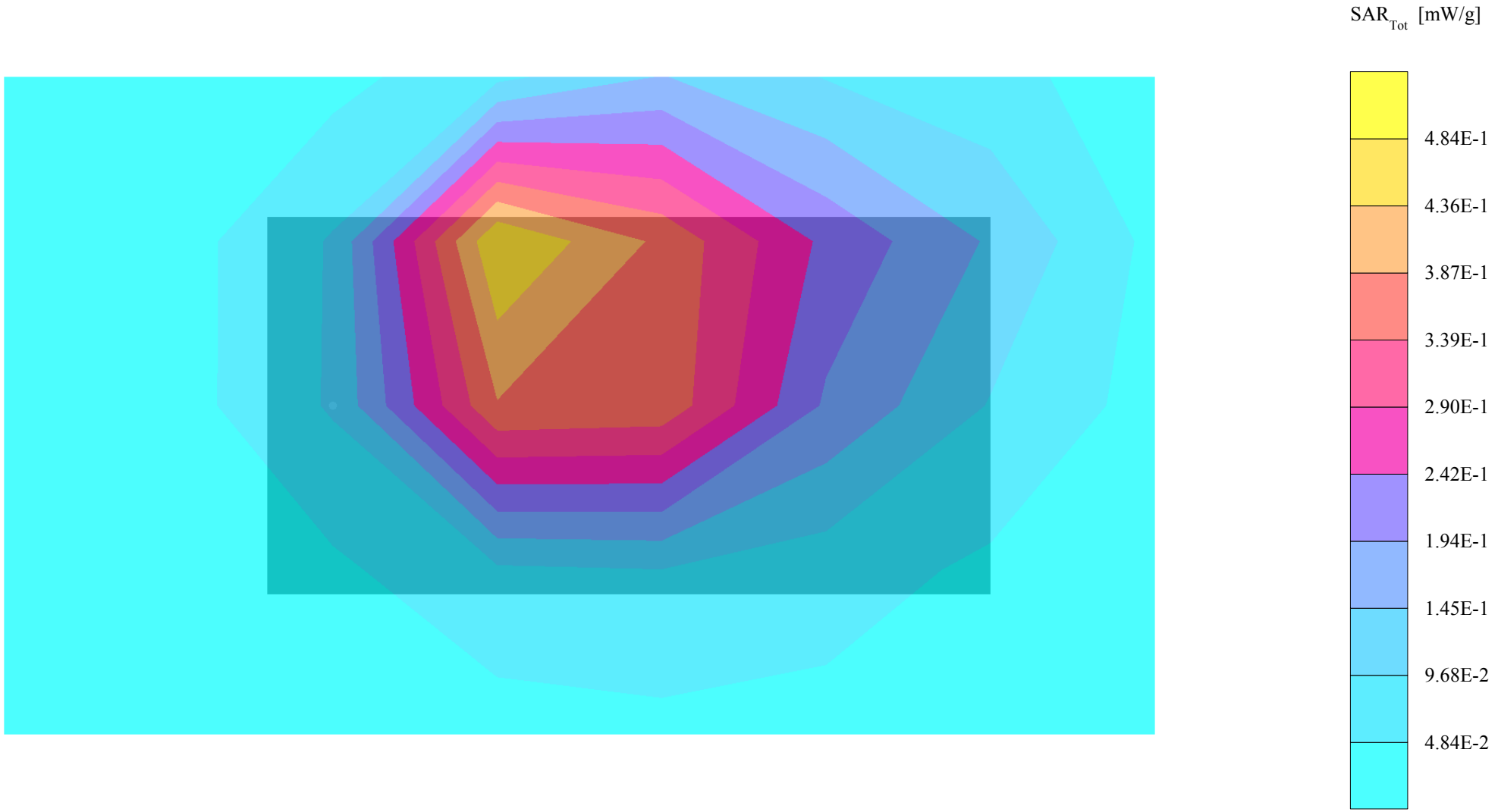
PY7A1021031 (03:001)

SAM 1 Phantom; Flat Section; Position: (90°,270°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1585; ConvF(4.80,4.80,4.80); Crest factor: 8.0; Body 1900MHz: σ = 1.45 mho/m ε_r = 50.8 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.0540 mW/g, SAR (10g): 0.0335 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.00 dB



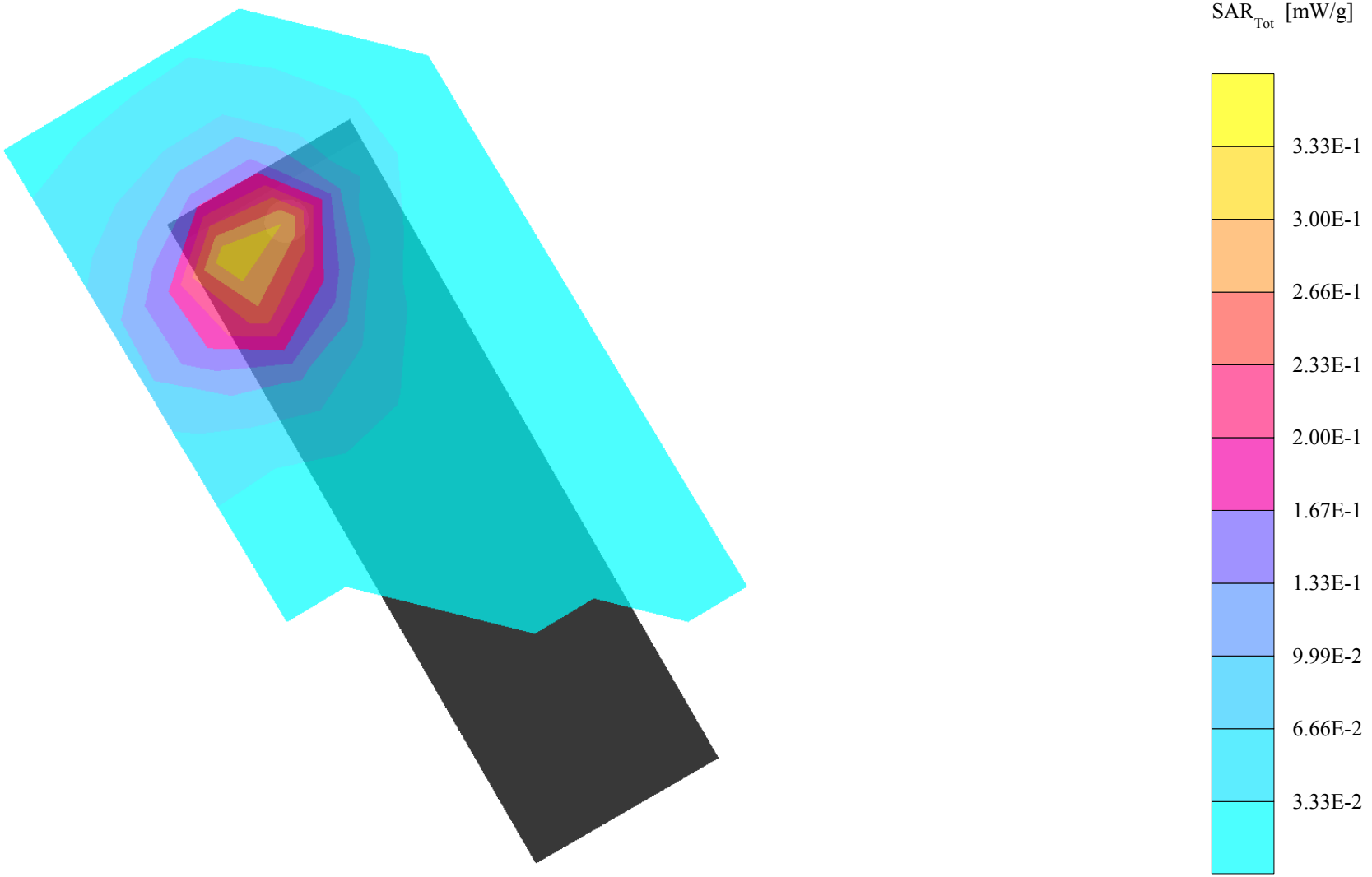
PY7A1021031 (03:001)

SAM 1 Phantom; Flat Section; Position: (90°,270°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1585; ConvF(4.80,4.80,4.80); Crest factor: 8.0; Body 1900MHz: σ = 1.45 mho/m ε_r = 50.8 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.564 mW/g, SAR (10g): 0.301 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.05 dB



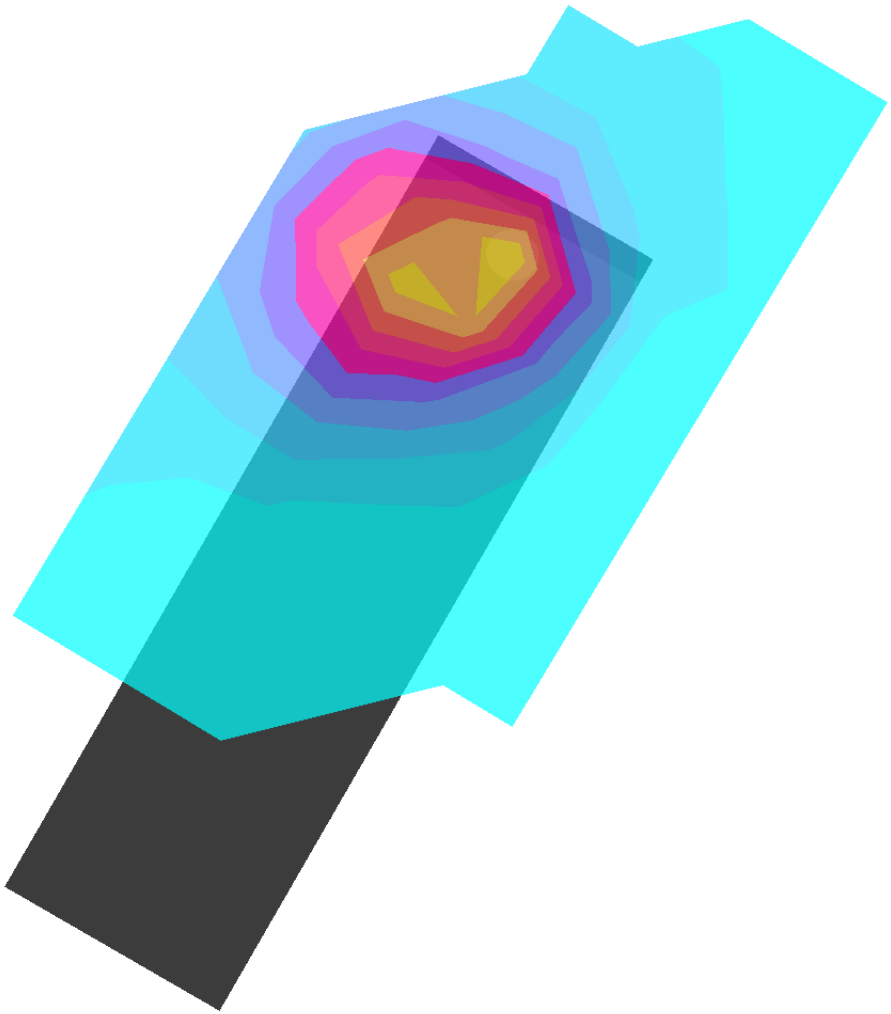
PY7A1021031 (03:001)

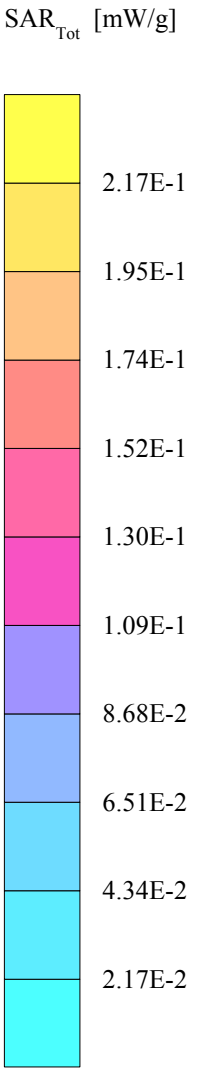
SAM 1 Phantom; Righ Hand Section; Position: (110°,300°); Frequency: 1910 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.320 mW/g, SAR (10g): 0.175 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.09 dB



PY7A1021031 (03:001)

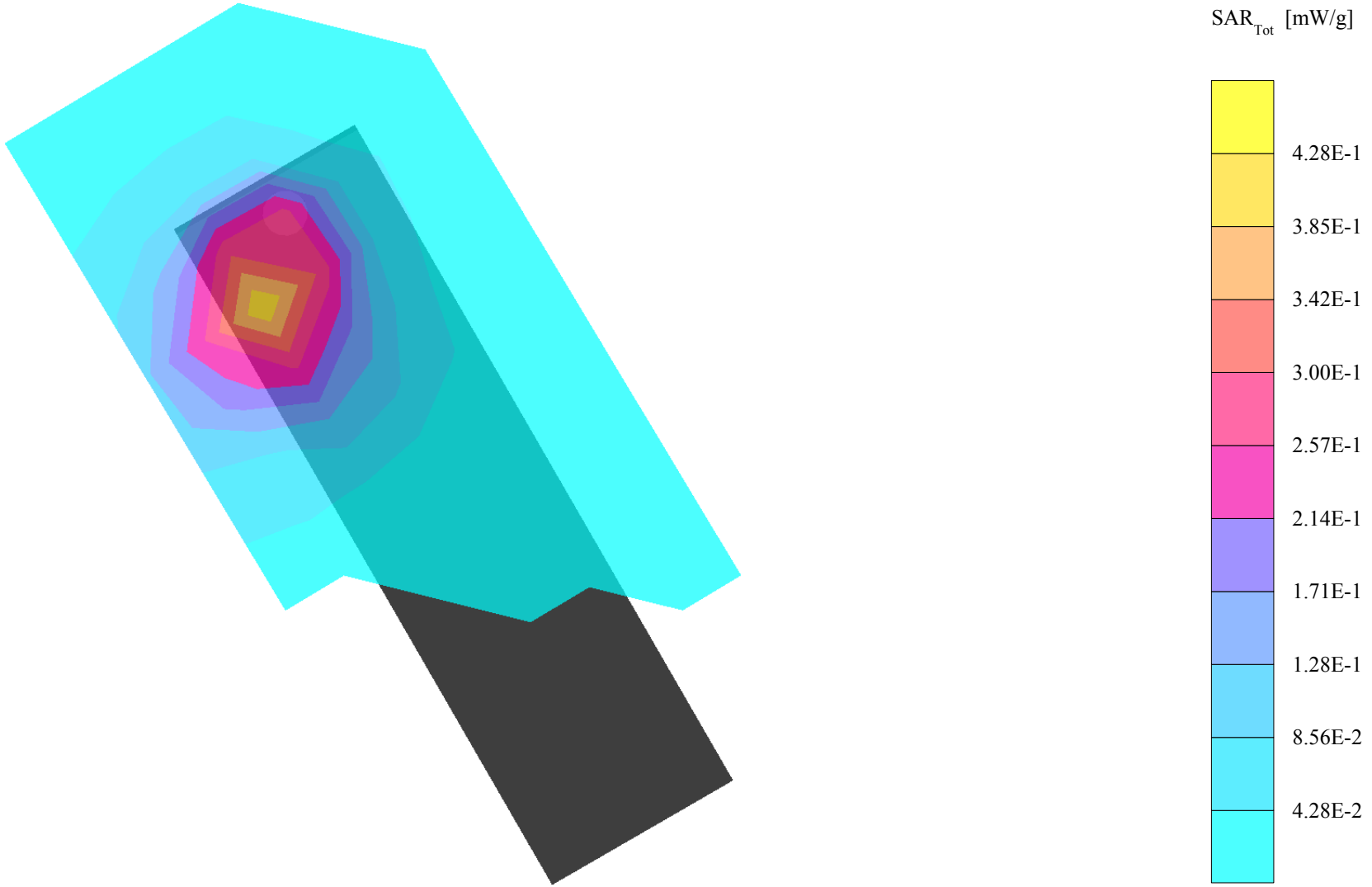
SAM 1 Phantom; Left Hand Section; Position: (110°,60°); Frequency: 1910 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.225 mW/g, SAR (10g): 0.126 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.09 dB





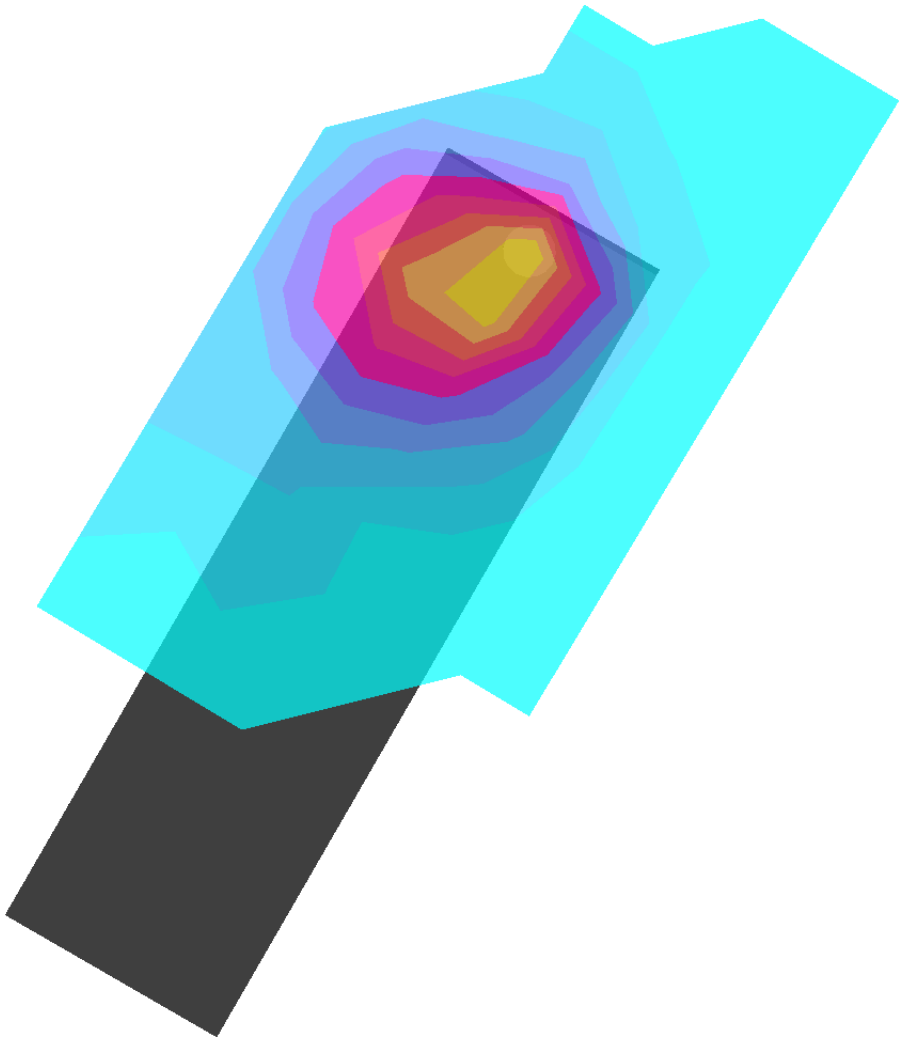
PY7A1021031 (03:001)

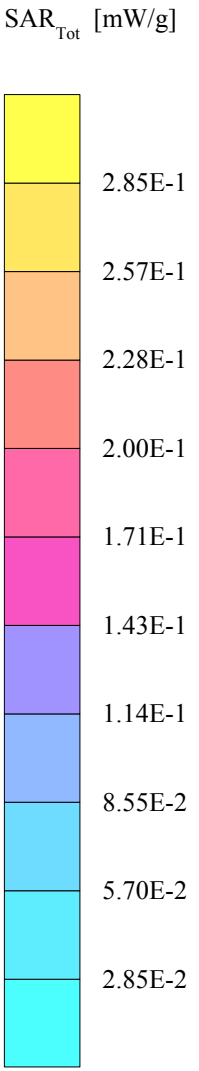
SAM 1 Phantom; Righ Hand Section; Position: (95°,300°); Frequency: 1910 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.390 mW/g, SAR (10g): 0.220 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.01 dB



PY7A1021031 (03:001)

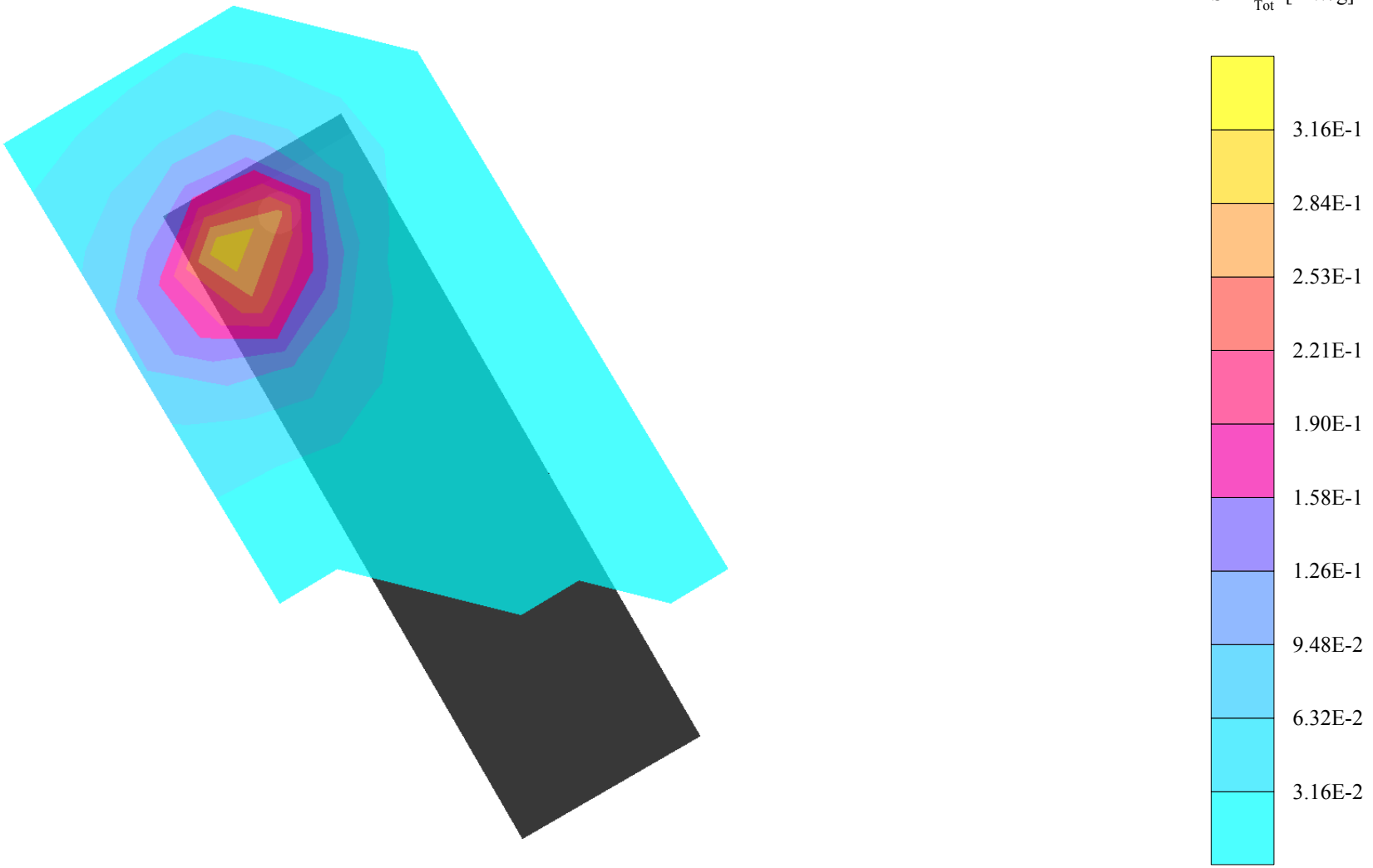
SAM 1 Phantom; Left Hand Section; Position: (95°,60°); Frequency: 1910 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.293 mW/g, SAR (10g): 0.165 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.08 dB





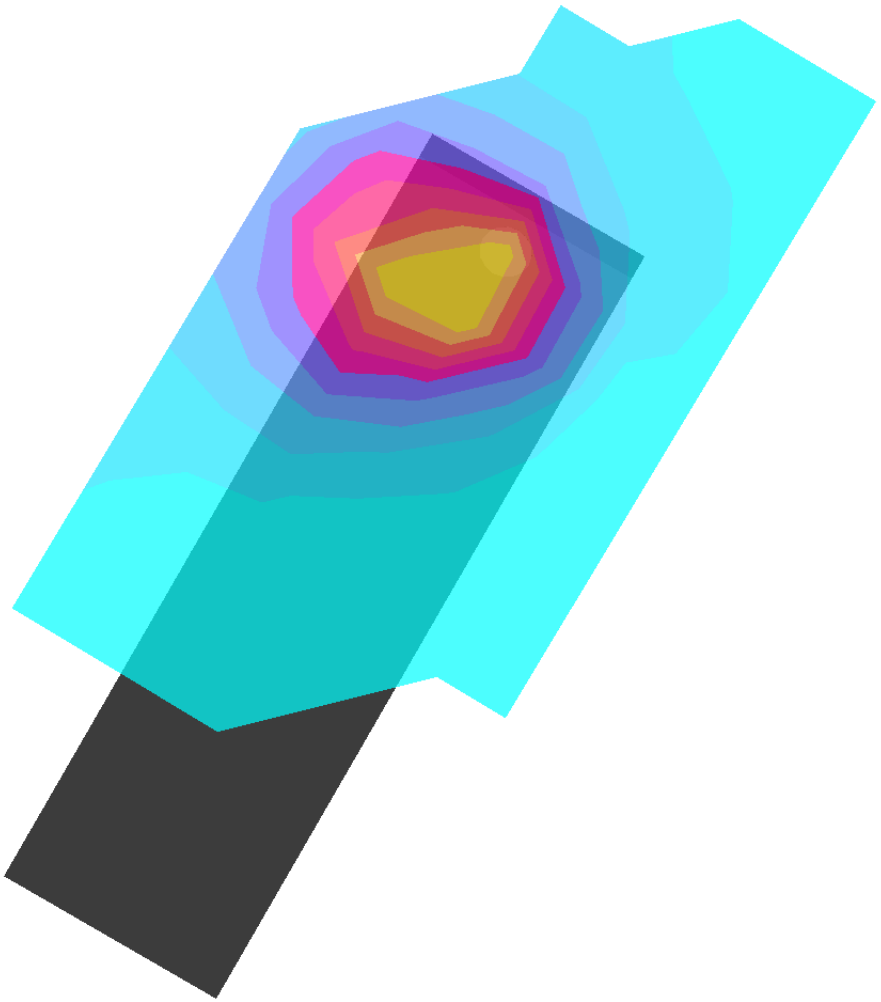
PY7A1021031 (03:001)

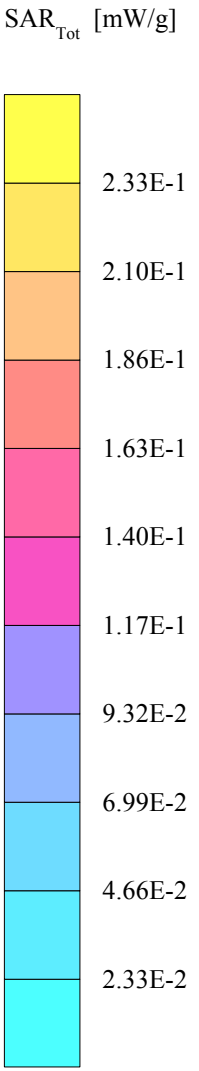
SAM 1 Phantom; Righ Hand Section; Position: (110°,300°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.297 mW/g, SAR (10g): 0.163 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.00 dB



PY7A1021031 (03:001)

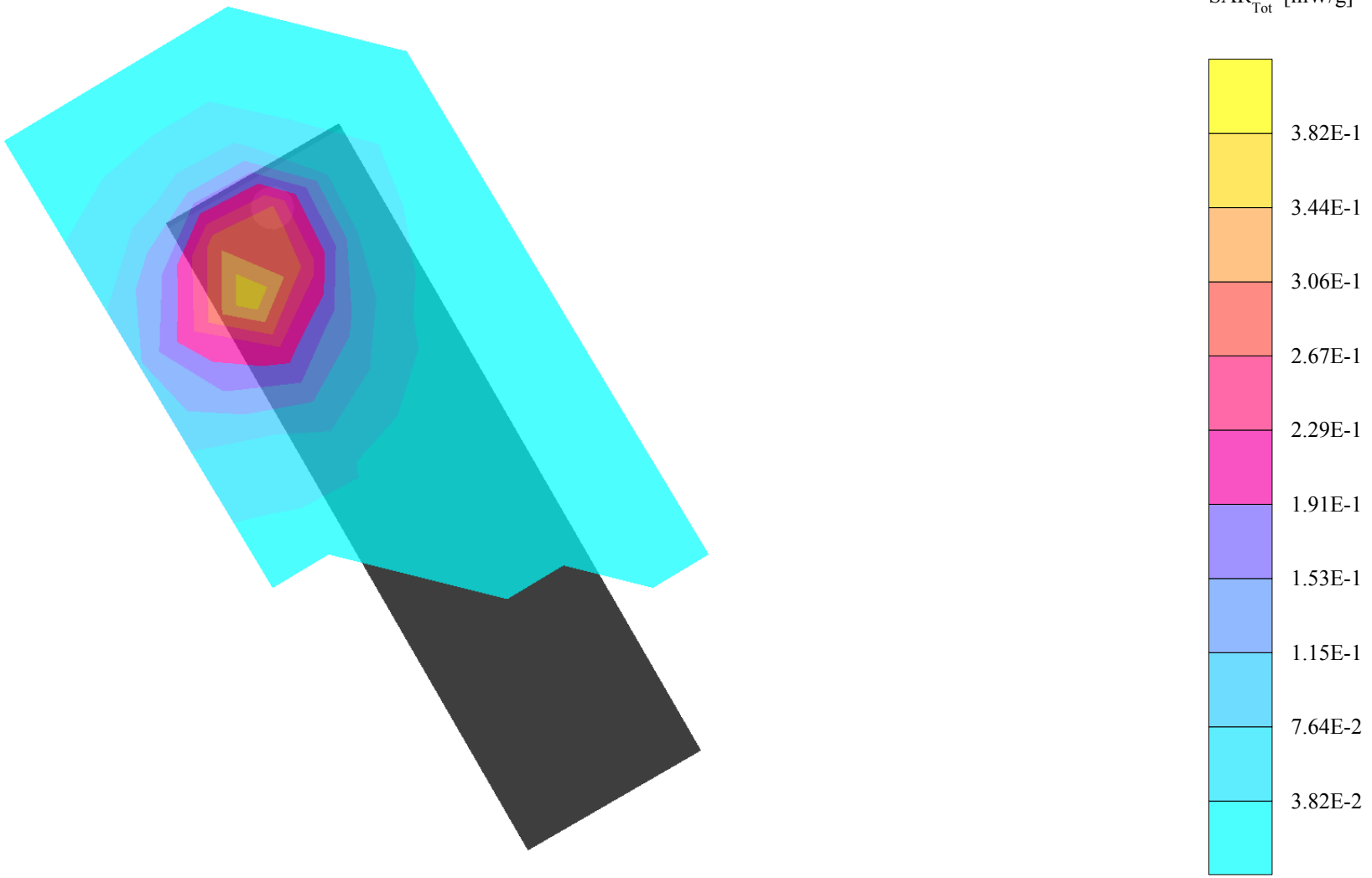
SAM 1 Phantom; Left Hand Section; Position: (110°,60°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.252 mW/g, SAR (10g): 0.139 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.03 dB





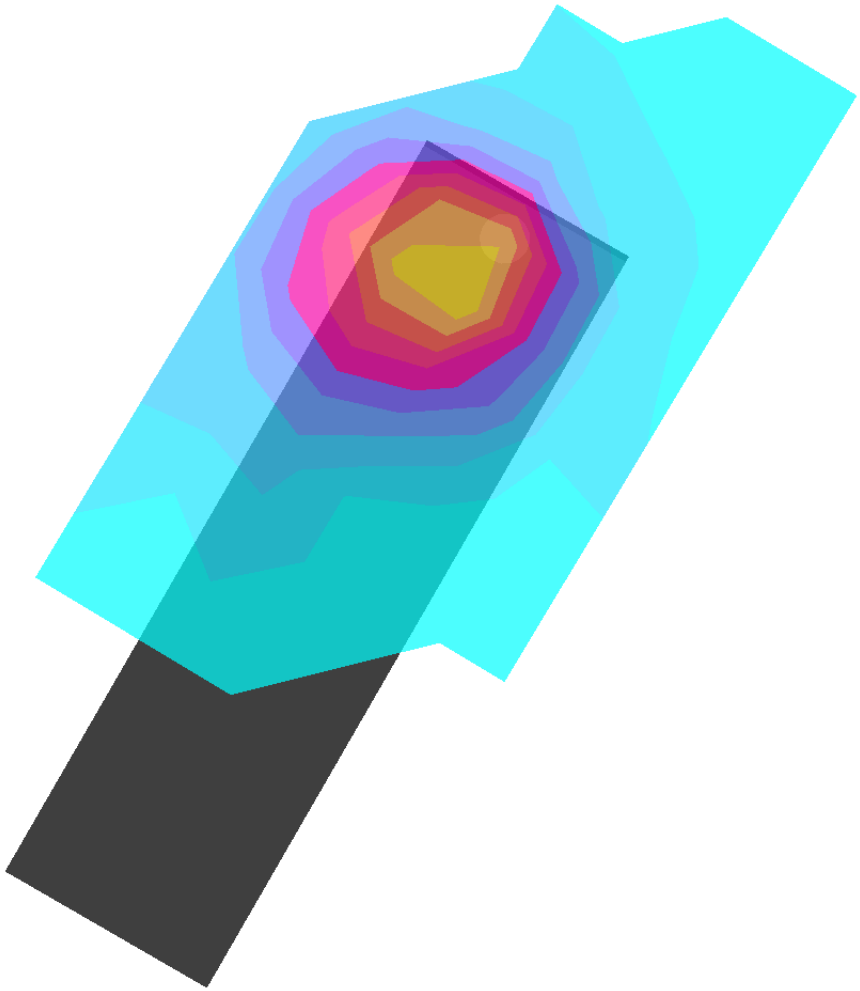
PY7A1021031 (03:001)

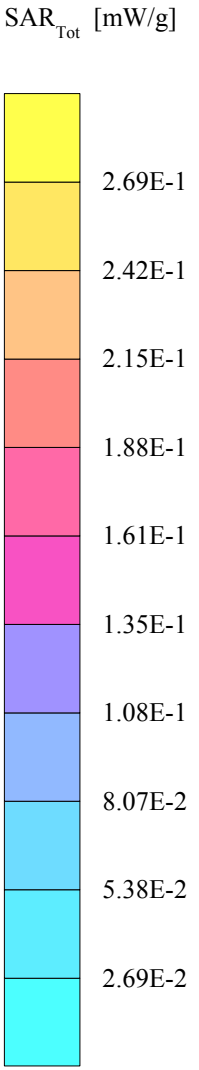
SAM 1 Phantom; Righ Hand Section; Position: (95°,300°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.347 mW/g, SAR (10g): 0.197 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.02 dB



PY7A1021031 (03:001)

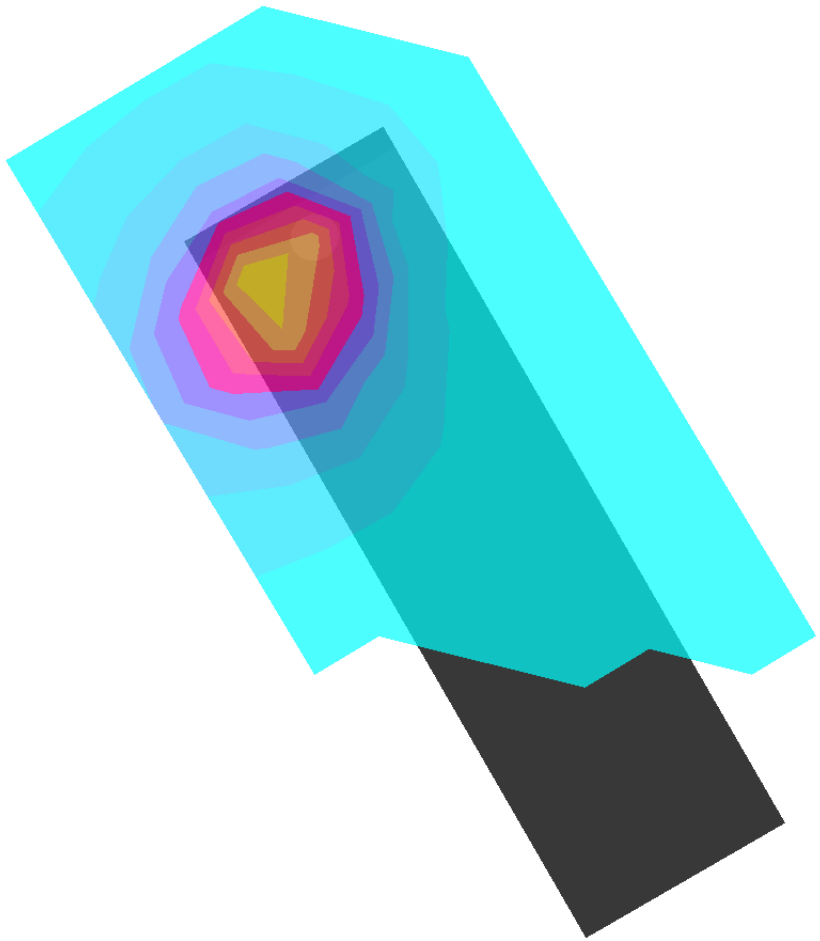
SAM 1 Phantom; Left Hand Section; Position: (95°,60°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1585; ConvF(5.20,5.20,5.20); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.274 mW/g, SAR (10g): 0.157 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.02 dB

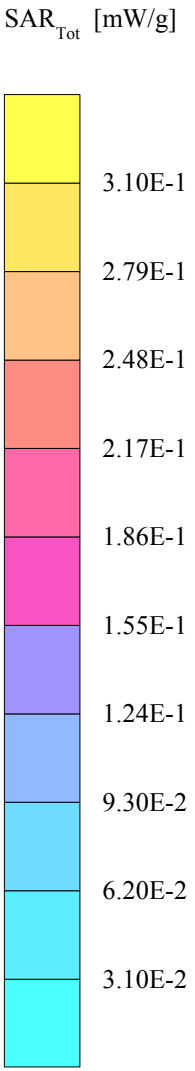




PY7A1021031 (03:001)

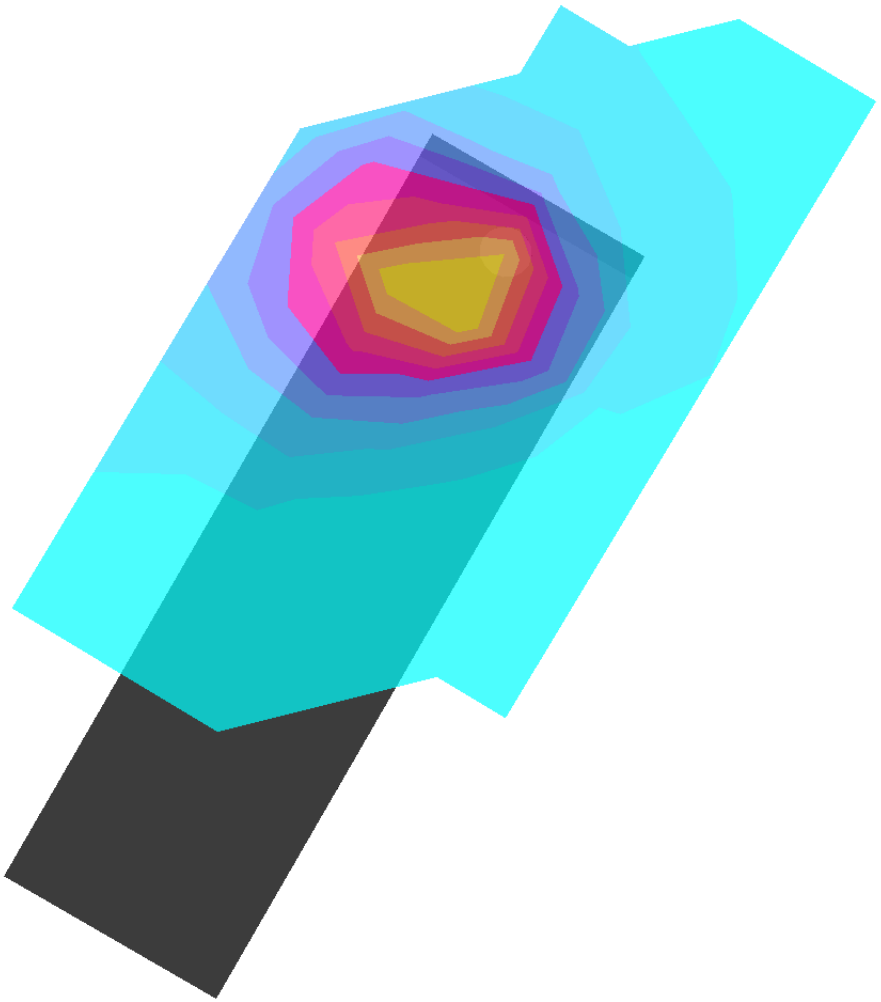
SAM 1 Phantom; Righ Hand Section; Position: (110°,300°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1585; ConvF(5.40,5.40,5.40); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.306 mW/g, SAR (10g): 0.170 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.01 dB

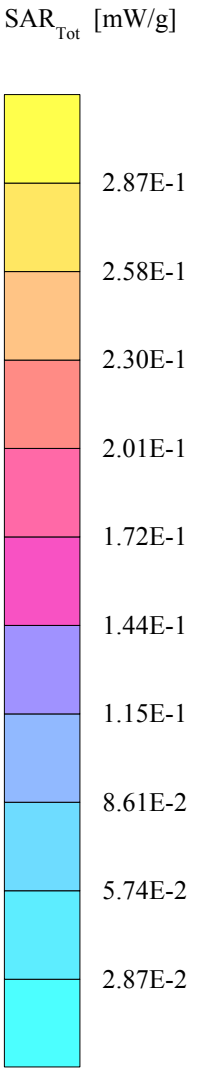




PY7A1021031 (03:001)

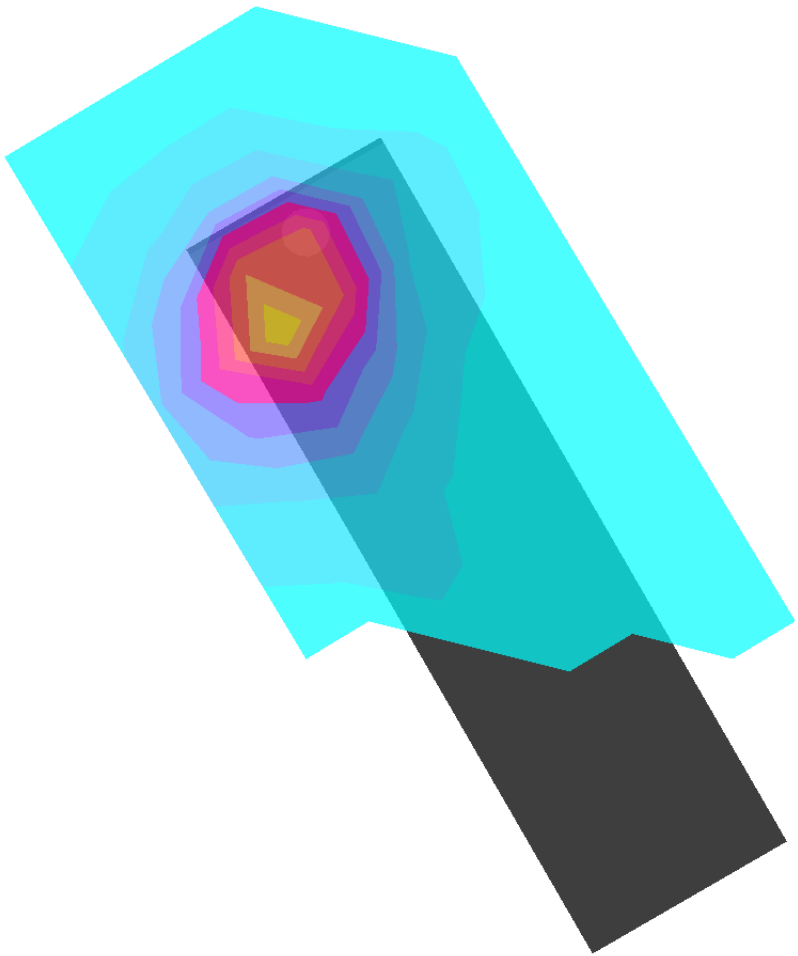
SAM 1 Phantom; Left Hand Section; Position: (110°,60°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1585; ConvF(5.40,5.40,5.40); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.313 mW/g, SAR (10g): 0.171 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.03 dB

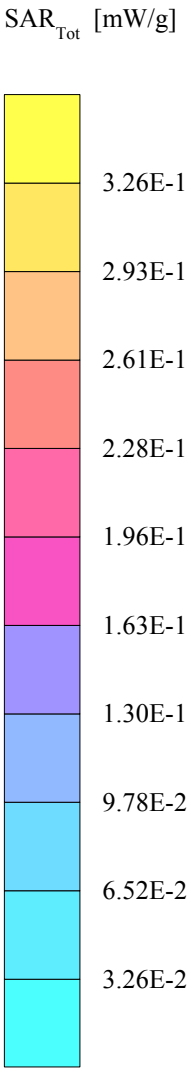




PY7A1021031 (03:001)

SAM 1 Phantom; Righ Hand Section; Position: (95°,300°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1585; ConvF(5.40,5.40,5.40); Crest factor: 8.0; Head 1900MHz: σ = 1.45 mho/m ε_r = 38.2 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.307 mW/g, SAR (10g): 0.174 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.01 dB





Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

Client **Sony Ericsson Lund**

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1585
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	April 16, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date	Scheduled Calibration
RF generator HP 8684C	US3642U01700	4-Aug-99 (in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	2-Apr-03	Apr-04
Power sensor HP 8481A	MY41092180	18-Sep-02	Sep-03
Power meter EPM E4419B	GB41293874	13-Sep-02	Sep-03
Network Analyzer HP 8753E	US38432426	3-May-00	In house check: May 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01	Sep-03

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: April 16, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Schmid & Partner Engineering AG

s p e a g

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Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Probe ET3DV6

SN:1585

Manufactured:	May 7, 2001
Last calibration:	April 25, 2002
Recalibrated:	April 16, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1585

Sensitivity in Free Space

Diode Compression

NormX	**1.80** $\mu V/(V/m)^2$		DCP X	**95**	mV
NormY	**1.67** $\mu V/(V/m)^2$		DCP Y	**95**	mV
NormZ	**1.83** $\mu V/(V/m)^2$		DCP Z	**95**	mV

Sensitivity in Tissue Simulating Liquid

Head **900 MHz** ε_r **= 41.5 ± 5%** σ **= 0.97 ± 5% mho/m**

ConvF X	**6.9** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**6.9** ± 8.9% (k=2)	Alpha	**0.33**
ConvF Z	**6.9** ± 8.9% (k=2)	Depth	**2.58**

Head **1800 MHz** ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

ConvF X	**5.4** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**5.4** ± 8.9% (k=2)	Alpha	**0.49**
ConvF Z	**5.4** ± 8.9% (k=2)	Depth	**2.48**

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	9.0	5.2
SAR_{be} [%]	With Correction Algorithm	0.3	0.5

Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

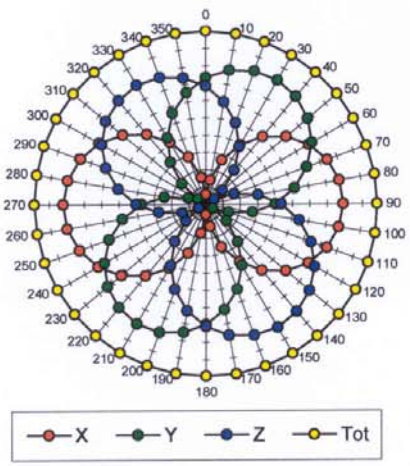
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	12.1	8.2
SAR_{be} [%]	With Correction Algorithm	0.2	0.3

Sensor Offset

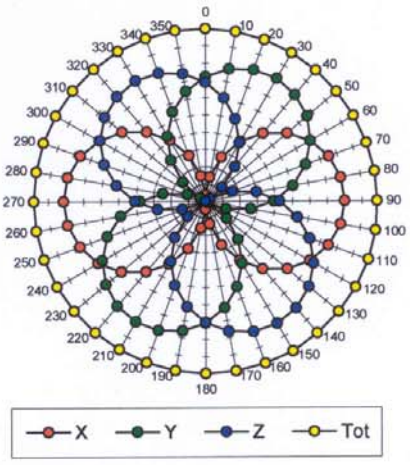
Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.3 ± 0.2**	mm

Receiving Pattern (ϕ , θ = 0°

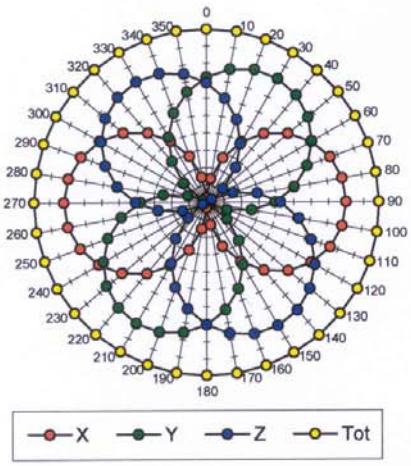
f = 30 MHz, TEM cell ifi110



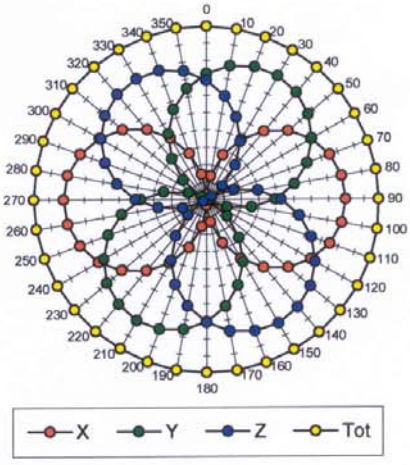
f = 100 MHz, TEM cell ifi110

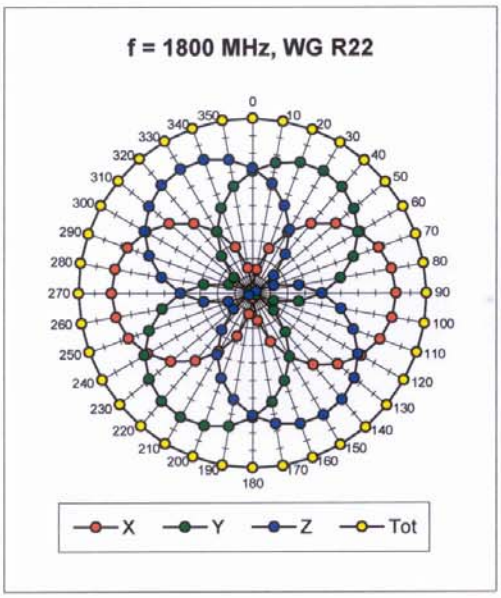


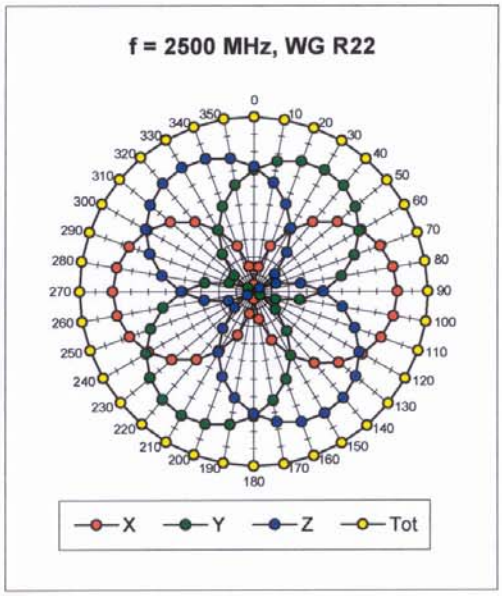
f = 300 MHz, TEM cell ifi110



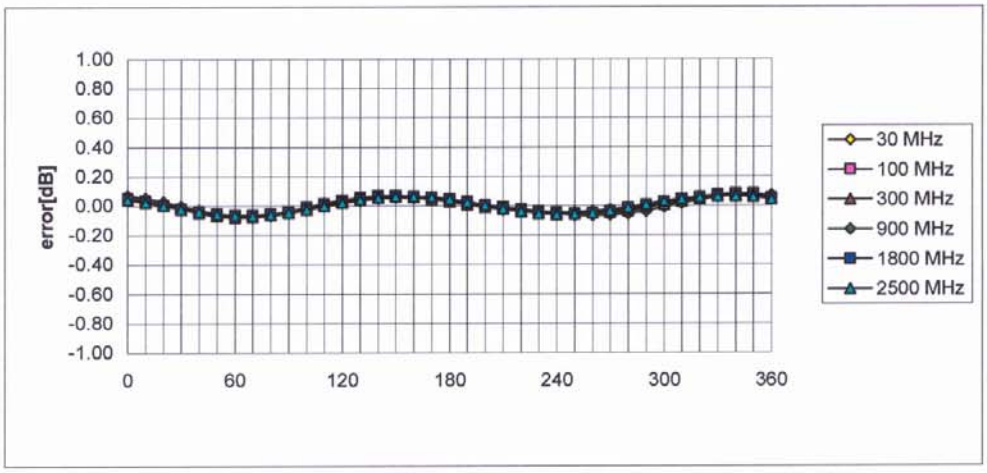
f = 900 MHz, TEM cell ifi110





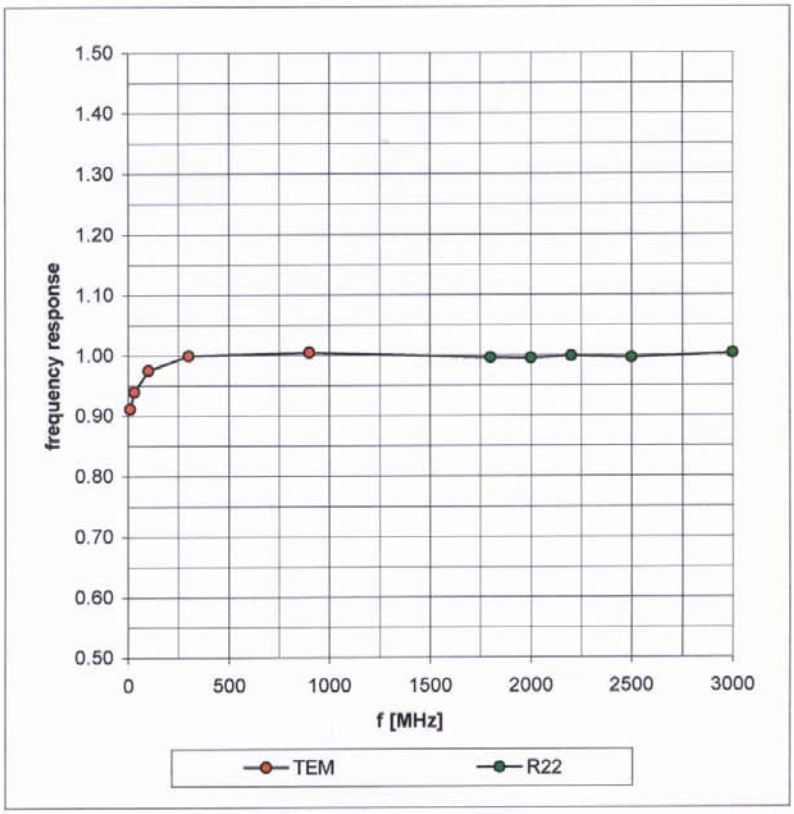


Isotropy Error (ϕ), θ = 0°



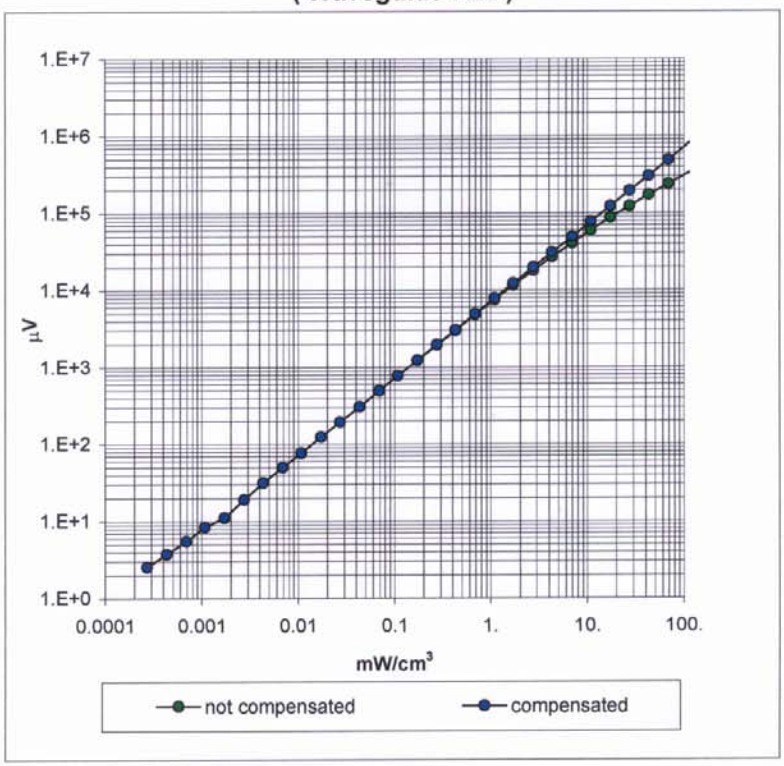
Frequency Response of E-Field

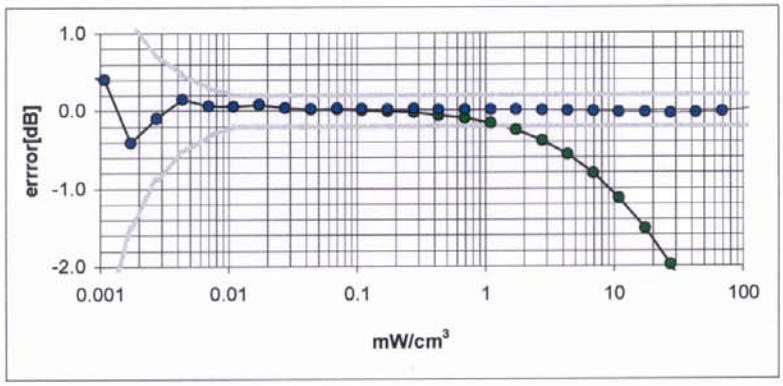
(TEM-Cell:ifi110, Waveguide R22)



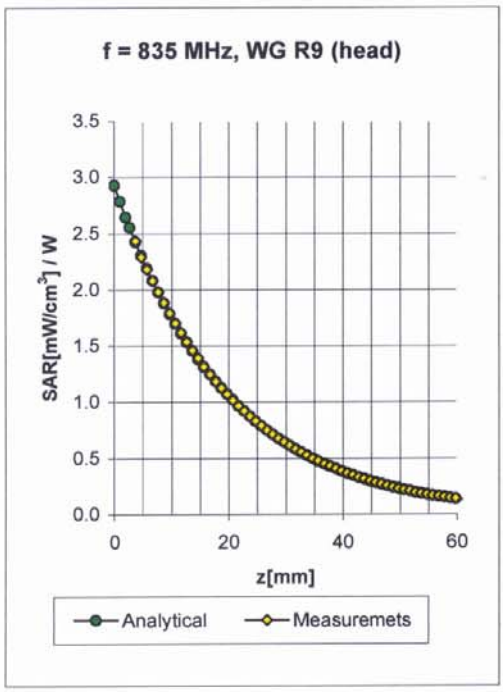
Dynamic Range f(SAR_{brain})

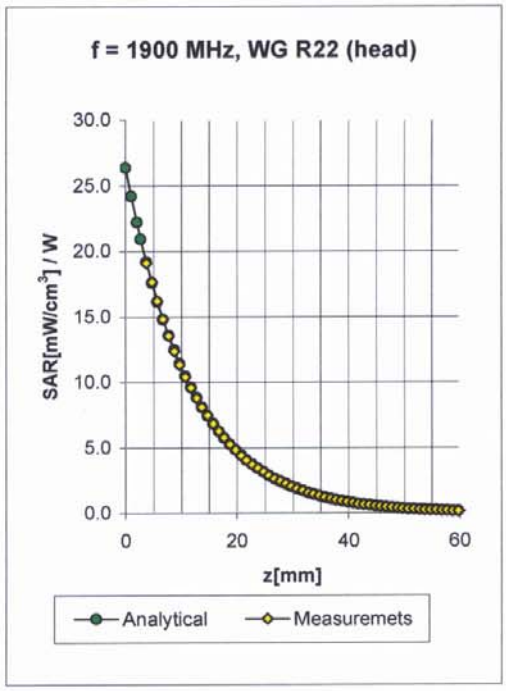
(Waveguide R22)





Conversion Factor Assessment





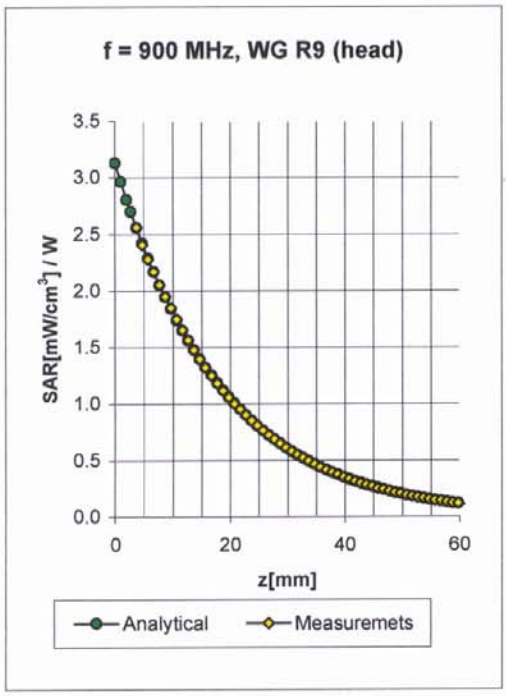
Head **835 MHz** ε_r **= 41.5 ± 5%** σ **= 0.90 ± 5% mho/m**

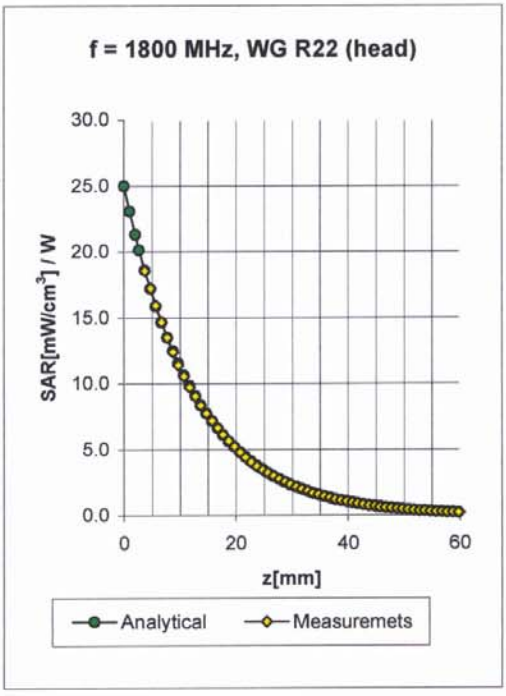
ConvF X	**7.0** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**7.0** ± 8.9% (k=2)	Alpha	**0.35**
ConvF Z	**7.0** ± 8.9% (k=2)	Depth	**2.43**

Head **1900 MHz** ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

ConvF X	**5.2** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**5.2** ± 8.9% (k=2)	Alpha	**0.51**
ConvF Z	**5.2** ± 8.9% (k=2)	Depth	**2.53**

Conversion Factor Assessment





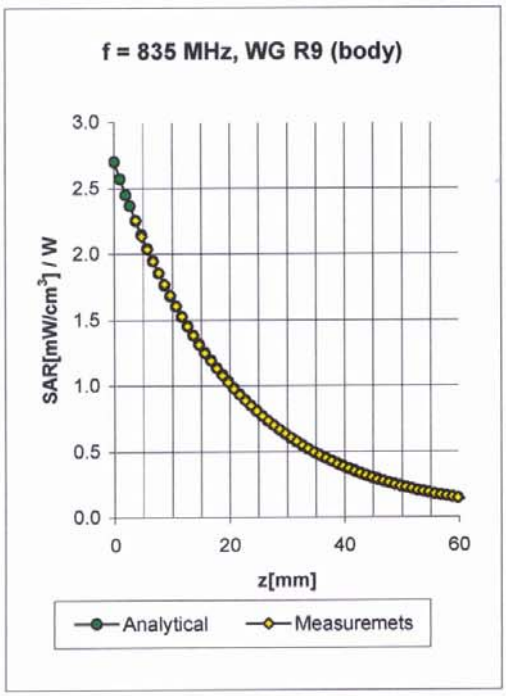
Head **900 MHz** ε_r **= 41.5 ± 5%** σ **= 0.97 ± 5% mho/m**

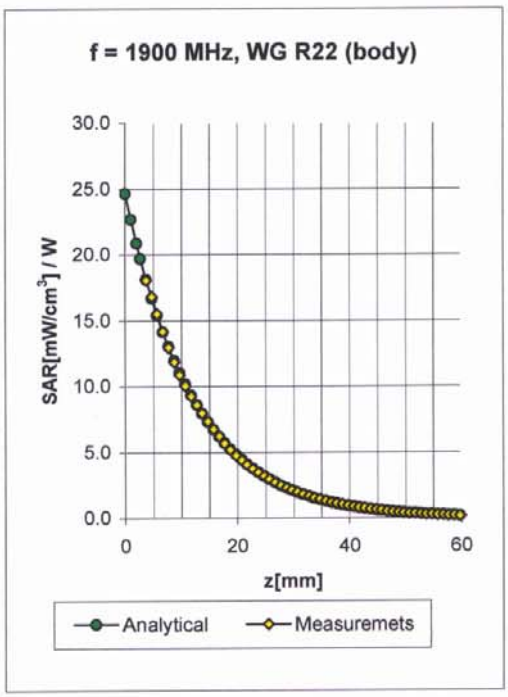
ConvF X	**6.9** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**6.9** ± 8.9% (k=2)	Alpha	**0.33**
ConvF Z	**6.9** ± 8.9% (k=2)	Depth	**2.58**

Head **1800 MHz** ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

ConvF X	**5.4** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**5.4** ± 8.9% (k=2)	Alpha	**0.49**
ConvF Z	**5.4** ± 8.9% (k=2)	Depth	**2.48**

Conversion Factor Assessment





Body **835 MHz** ε_r **= 55.2 ± 5%** σ **= 0.97 ± 5% mho/m**

Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

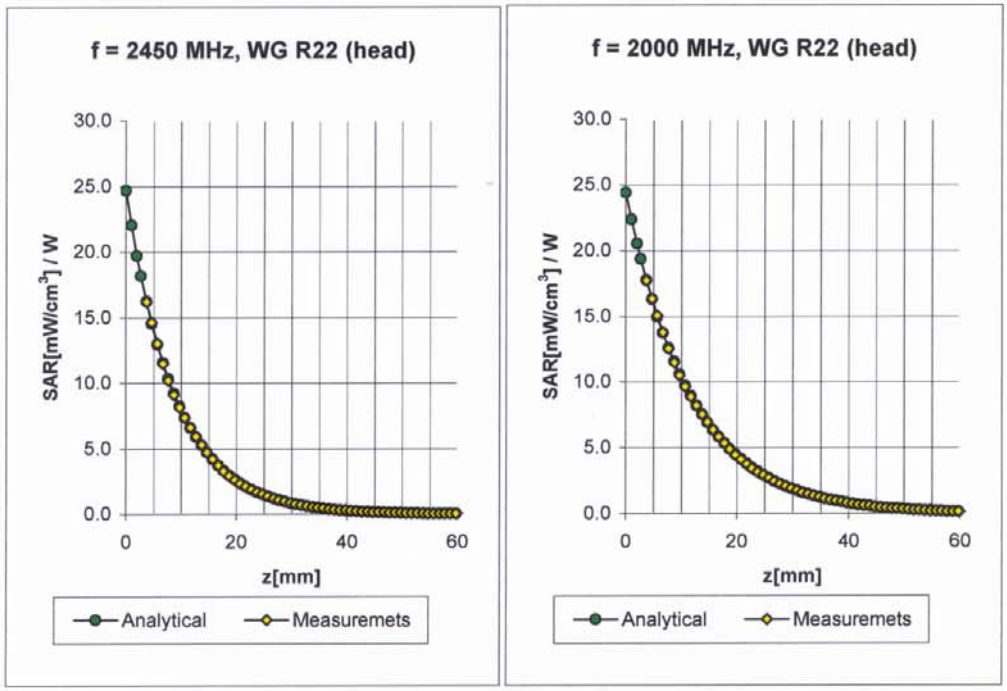
ConvF X	**6.7** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.7** ± 9.5% (k=2)	Alpha	**0.34**
ConvF Z	**6.7** ± 9.5% (k=2)	Depth	**2.48**

Body **1900 MHz** ε_r **= 53.3 ± 5%** σ **= 1.52 ± 5% mho/m**

Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.8** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.8** ± 9.5% (k=2)	Alpha	**0.59**
ConvF Z	**4.8** ± 9.5% (k=2)	Depth	**2.55**

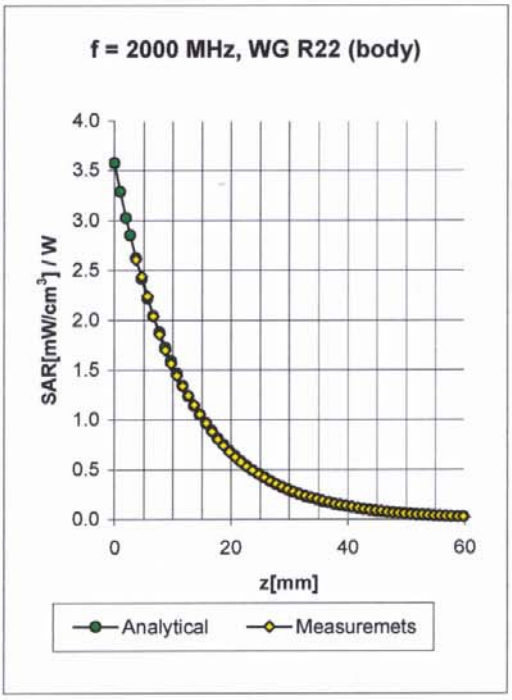
Conversion Factor Assessment



Head	2450	MHz	ε_r = 39.2 ± 5%	σ = 1.80 ± 5% mho/m
	ConvF X	4.9 ± 8.9% (k=2)	Boundary effect:	
	ConvF Y	4.9 ± 8.9% (k=2)	Alpha	0.91
	ConvF Z	4.9 ± 8.9% (k=2)	Depth	1.89

Head	2000	MHz	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m
	ConvF X	5.1 ± 8.9% (k=2)	Boundary effect:	
	ConvF Y	5.1 ± 8.9% (k=2)	Alpha	0.46
	ConvF Z	5.1 ± 8.9% (k=2)	Depth	2.90

Conversion Factor Assessment



Body **2000 MHz** ε_r **= 53.3 ± 5%** σ **= 1.52 ± 5% mho/m**

ConvF X	**4.7** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**4.7** ± 8.9% (k=2)	Alpha	**0.69**
ConvF Z	**4.7** ± 8.9% (k=2)	Depth	**2.35**

Deviation from Isotropy in HSL

Error ($\theta\phi$), f = 900 MHz