
Appendix for the Report

Dosimetric Assessment of the

Mirea MGH 900

(FCC ID: PLUMGH-900)

According to the FCC Requirements

SAR Distribution Plots

February 05, 2004
IMST GmbH
Carl-Friedrich-Gauß-Str. 2
D-47475 Kamp-Lintfort

Customer
7 layers AG
Borsigstrasse 11
D-40880 Ratingen

The test results only relate to the items tested.
This report shall not be reproduced except in full without the written
approval of the testing laboratory.

Table of Contents

1	SAR DISTRIBUTION PLOTS, PCS 1900 HEAD.....	3
2	SAR DISTRIBUTION PLOTS, PCS 1900 BODY.....	11
3	SAR Z-AXIS SCANS (VALIDATION).....	14
4	SAR Z-AXIS SCANS (MEASUREMENTS).....	16

1 SAR Distribution Plots, PCS 1900 Head

Test Laboratory: IMST; File Name: [mghplm_1.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003

- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

- Electronics: DAE3 Sn565; Calibrated: 04.04.2003

- Phantom: SAM TP:1176; ;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek left/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 5.31 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 1.11 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.548 mW/g

Reference Value = 5.31 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 1.11 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.918 W/kg

SAR(1 g) = 0.634 mW/g; SAR(10 g) = 0.405 mW/g

Reference Value = 5.31 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 0.682 mW/g

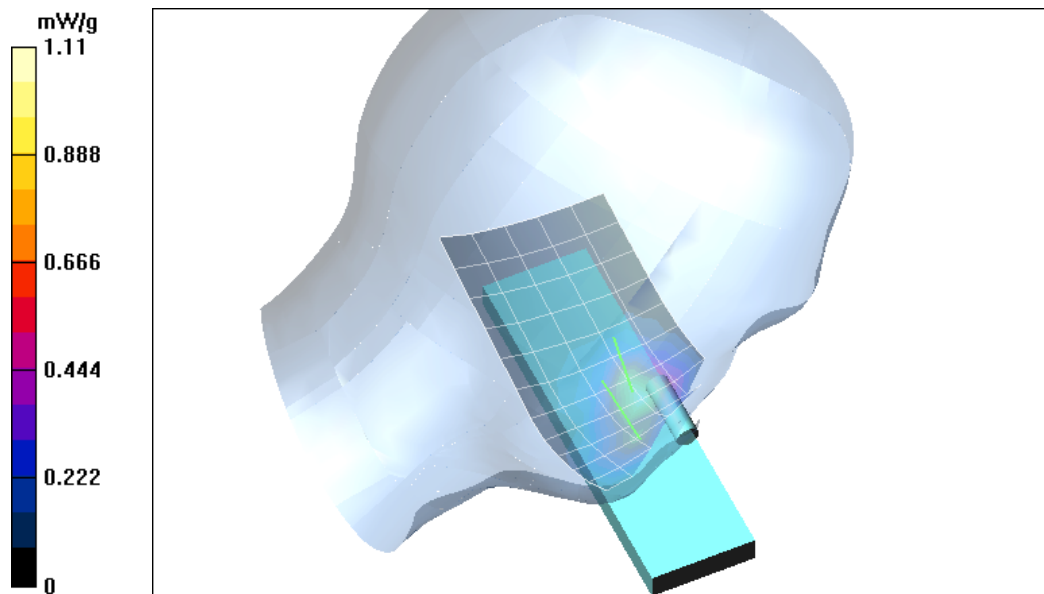


Fig. 1: SAR distribution for PCS 1900, channel 661, cheek position, left side of head. (December 01, 2003; Ambient Temperature: 20.3° C; Liquid Temperature : 19.4° C).

Test Laboratory: IMST File Name: [mghplm_2.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003

- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

- Electronics: DAE3 Sn565; Calibrated: 04.04.2003

- Phantom: SAM TP:1176; ;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

tilted left/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 9.12 V/m

Power Drift = 0.02 dB

Maximum value of SAR = 0.142 mW/g

tilted left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.178 W/kg

SAR(1 g) = 0.127 mW/g; SAR(10 g) = 0.0775 mW/g

Reference Value = 9.12 V/m

Power Drift = 0.02 dB

Maximum value of SAR = 0.138 mW/g

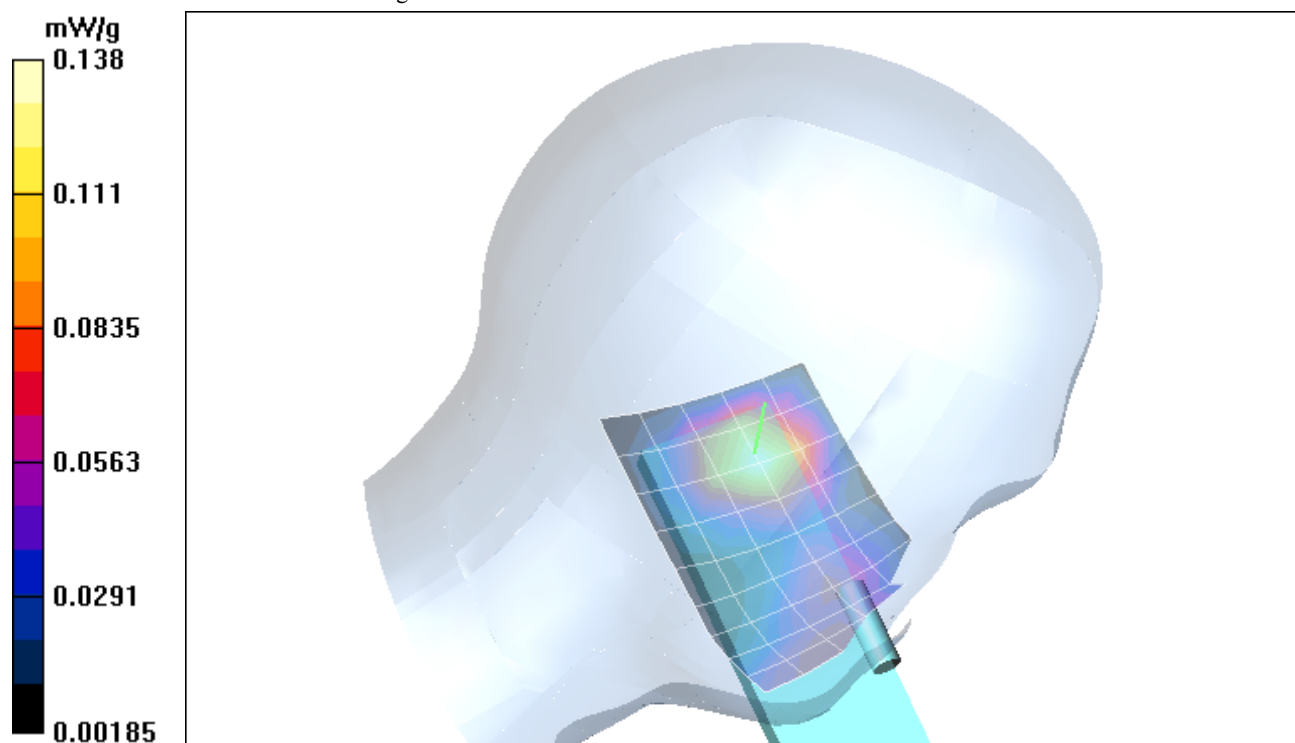


Fig. 2: SAR distribution for PCS 1900, channel 661, tilted position, left side of head. (December 01, 2003; Ambient Temperature: 20.4° C; Liquid Temperature : 19.4° C).

Test Laboratory: IMST; File Name: [mghgrm_1.da4](#)

DUT: Mirrae; Type:

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003

- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

- Electronics: DAE3 Sn565; Calibrated: 04.04.2003

- Phantom: SAM TP:1176; ;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek right/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 5.17 V/m

Power Drift = -0.15 dB

Maximum value of SAR = 0.943 mW/g

cheek right/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 0.818 mW/g; SAR(10 g) = 0.44 mW/g

Reference Value = 5.17 V/m

Power Drift = -0.15dB

Maximum value of SAR = 0.909 mW/g

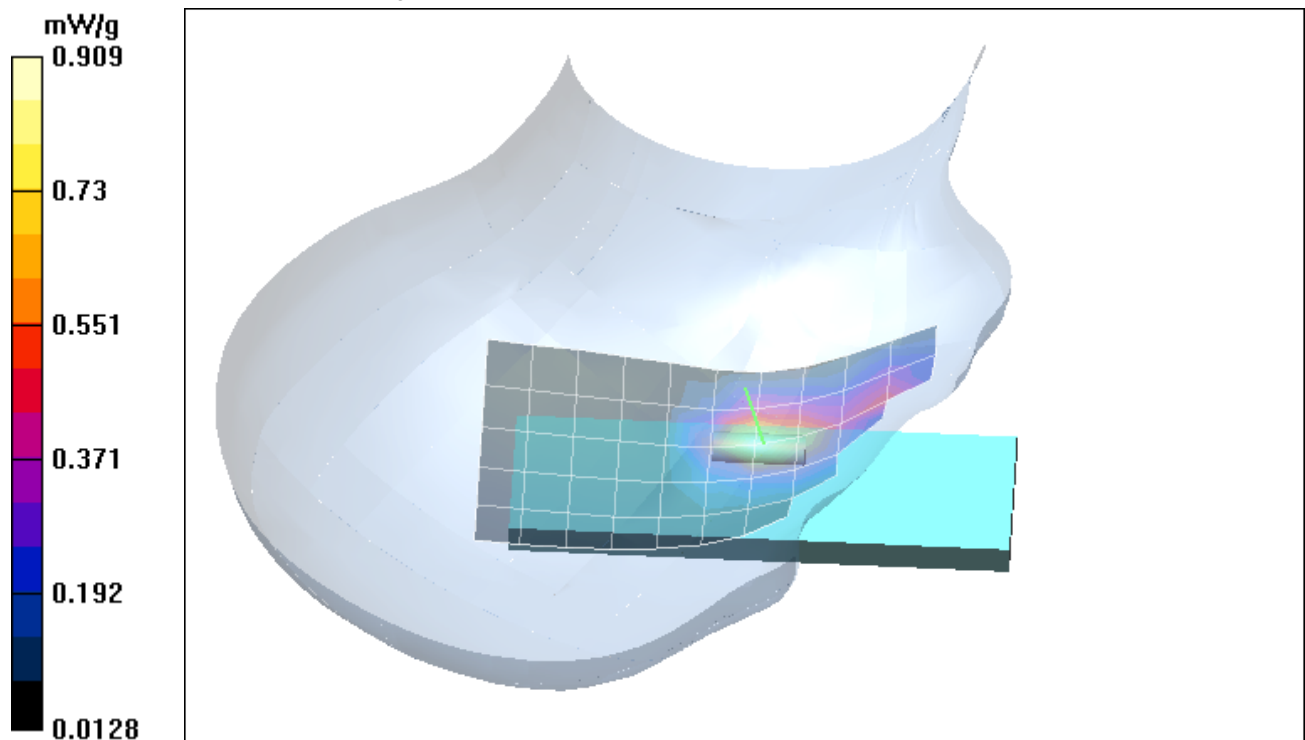


Fig. 3: SAR distribution for PCS 1900, channel 661, cheek position, right side of head. (December 01, 2003; Ambient Temperature: 20.4° C; Liquid Temperature : 19.3° C).

Test Laboratory: IMST File Name: [mghprm_2.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003

- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

- Electronics: DAE3 Sn565; Calibrated: 04.04.2003

- Phantom: SAM TP:1176; ;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

tilted right/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 9.31 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.142 mW/g

tilted right/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.2 W/kg

SAR(1 g) = 0.136 mW/g; SAR(10 g) = 0.0835 mW/g

Reference Value = 9.31 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.147 mW/g

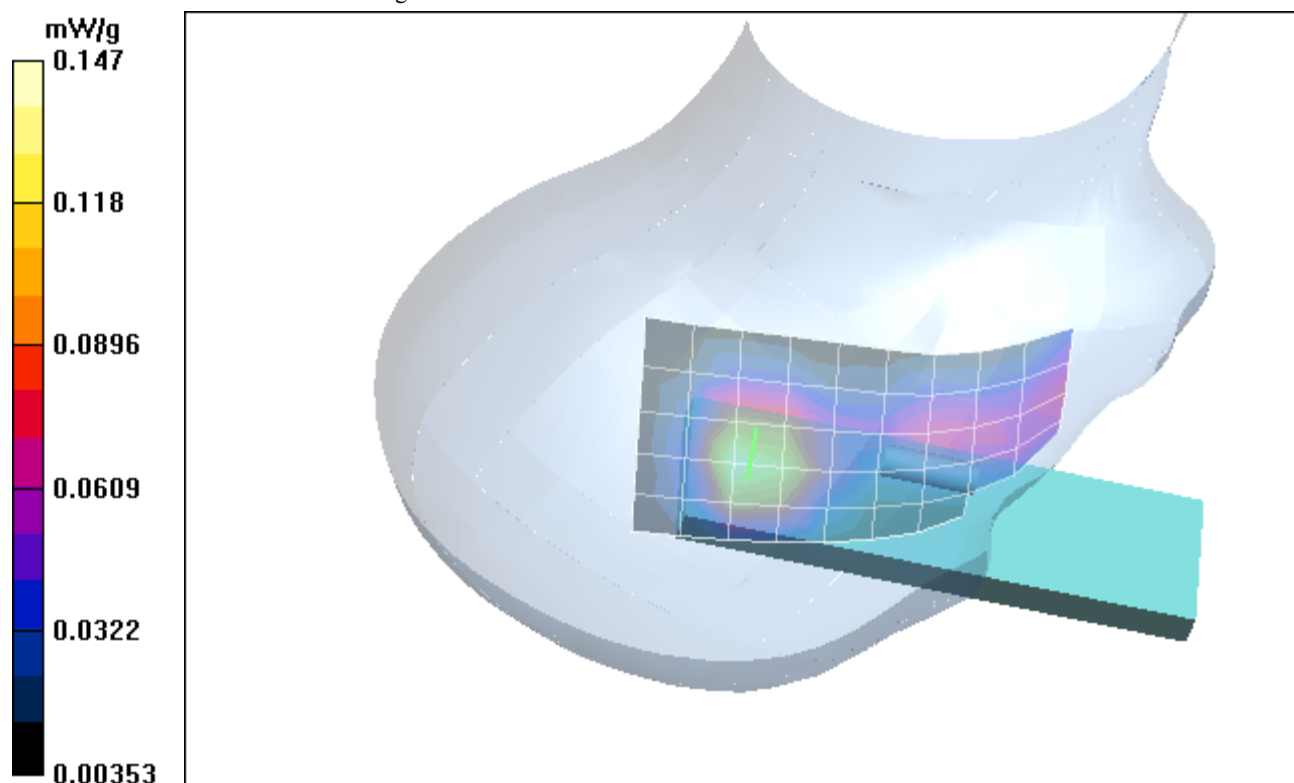


Fig. 4: SAR distribution for PCS 1900, channel 661, tilted position, right side of head. (December 01, 2003; Ambient Temperature: 20.1° C; Liquid Temperature : 19.5° C).

Test Laboratory: IMST File Name: [mghpll_1.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn565; Calibrated: 04.04.2003
- Phantom: SAM TP:1176; ;
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek left/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 5.4 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 1.12 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.62 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.553 mW/g

Reference Value = 5.4 V/m

Power Drift = -0.1 dB

Maximum value of SAR = 1.14 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.947 W/kg

SAR(1 g) = 0.666 mW/g; SAR(10 g) = 0.434 mW/g

Reference Value = 5.4 V/m

Power Drift = -0.1 dB

Maximum value of SAR = 0.715 mW/g

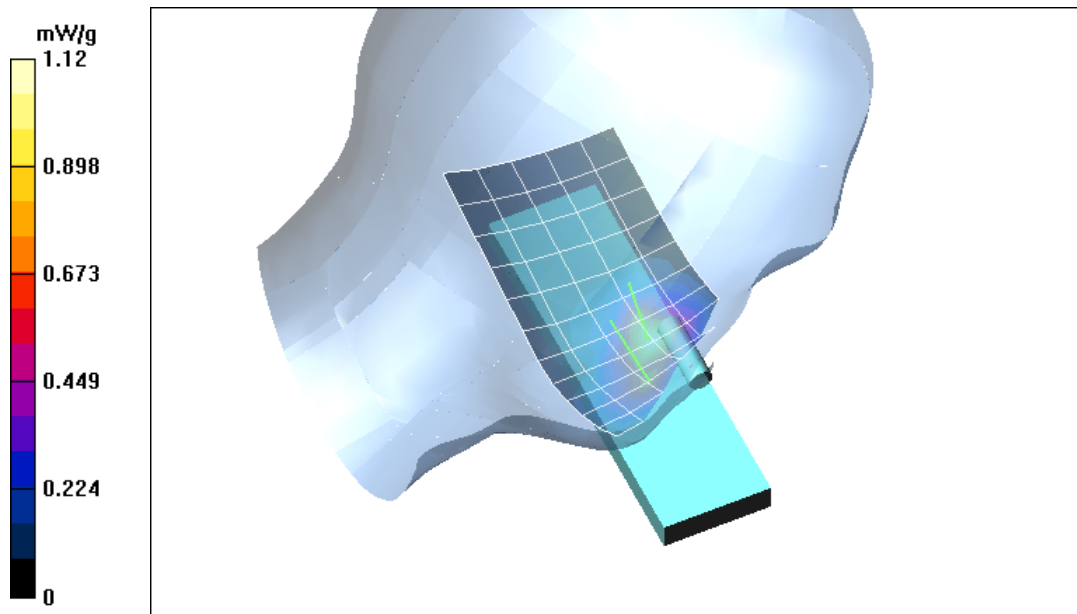


Fig. 5: SAR distribution for PCS 1900, channel 512, cheek position, left side of head. (December 01, 2003; Ambient Temperature: 20.3° C; Liquid Temperature : 19.4° C).

Test Laboratory: IMST File Name: [mghplh_1.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn565; Calibrated: 04.04.2003
- Phantom: SAM TP:1176; ;
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek left/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 5.27 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 0.971 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.57 W/kg

SAR(1 g) = 0.934 mW/g; SAR(10 g) = 0.493 mW/g

Reference Value = 5.27 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 1.04 mW/g

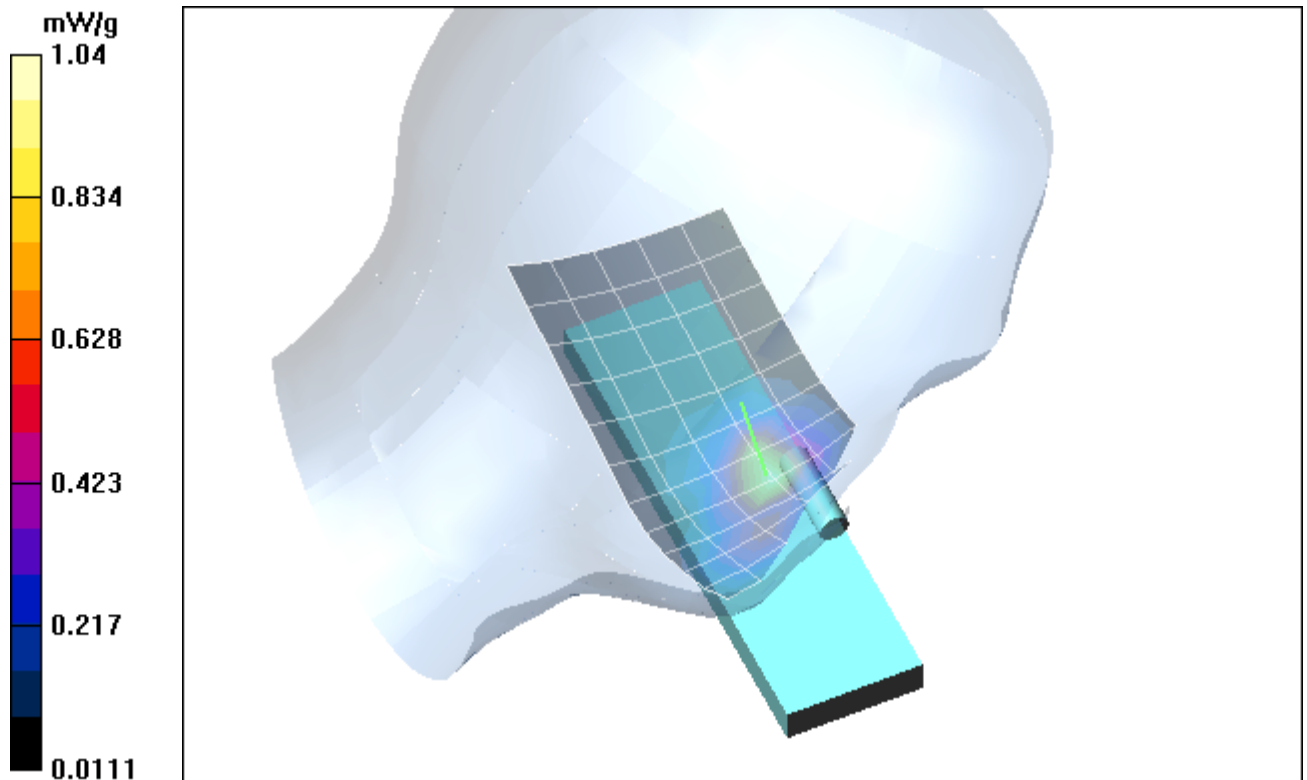


Fig. 6: SAR distribution for PCS 1900, channel 810, cheek position, left side of head. (December 01, 2003; Ambient Temperature: 20.3° C; Liquid Temperature : 19.4° C).

Test Laboratory: IMST File Name: [mghprl_1.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn565; Calibrated: 04.04.2003
- Phantom: SAM TP:1176; ;
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek right/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 4.9 V/m

Power Drift = -0.01 dB

Maximum value of SAR = 1.03 mW/g

cheek right/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.6 W/kg

SAR(1 g) = 0.995 mW/g; SAR(10 g) = 0.535 mW/g

Reference Value = 4.9 V/m

Power Drift = -0.01 dB

Maximum value of SAR = 1.1 mW/g

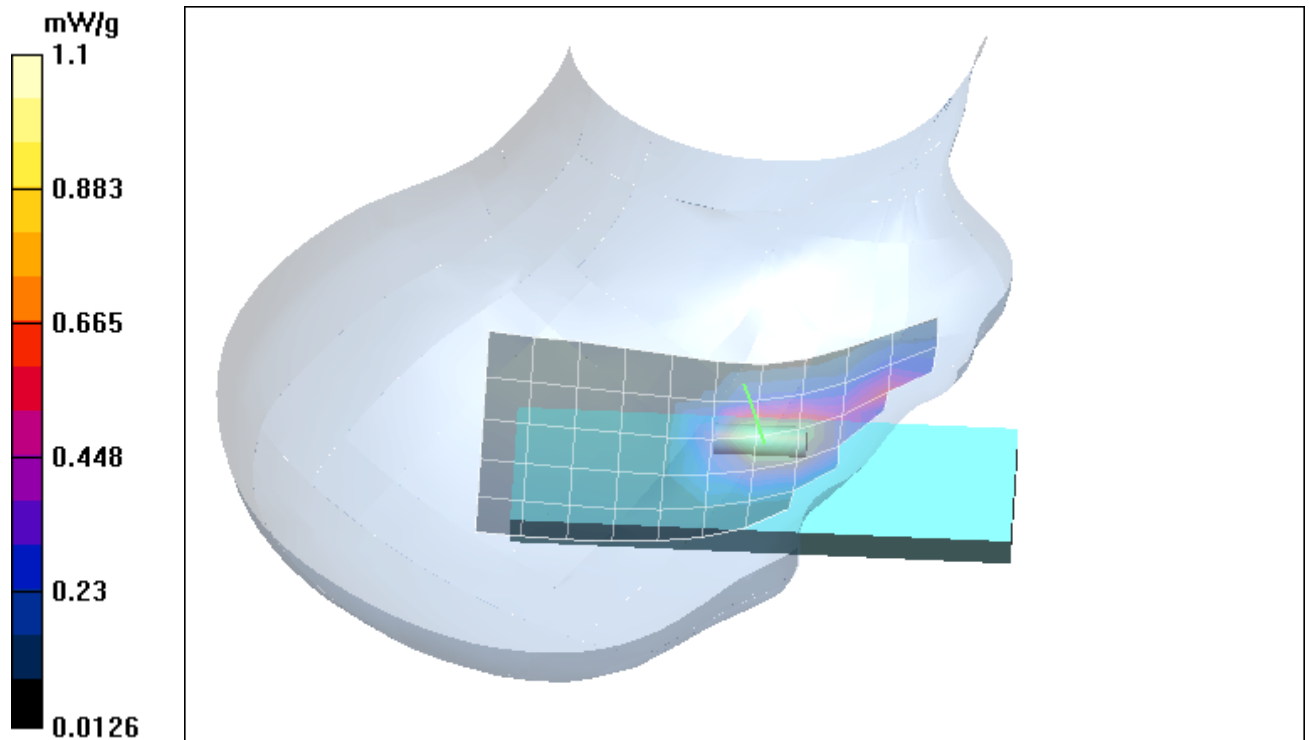


Fig. 7: SAR distribution for PCS 1900, channel 512, cheek position, right side of head. (December 01, 2003; Ambient Temperature: 20.4° C; Liquid Temperature : 19.3° C).

Test Laboratory: IMST File Name: [mghprh_1.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.4$ mho/m, $\epsilon_r = 38.4$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn565; Calibrated: 04.04.2003
- Phantom: SAM TP:1176; ;
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek right/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 6.38 V/m

Power Drift = 0.2 dB

Maximum value of SAR = 0.944 mW/g

cheek right/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.912 mW/g; SAR(10 g) = 0.485 mW/g

Reference Value = 6.38 V/m

Power Drift = 0.2 dB

Maximum value of SAR = 1.01 mW/g

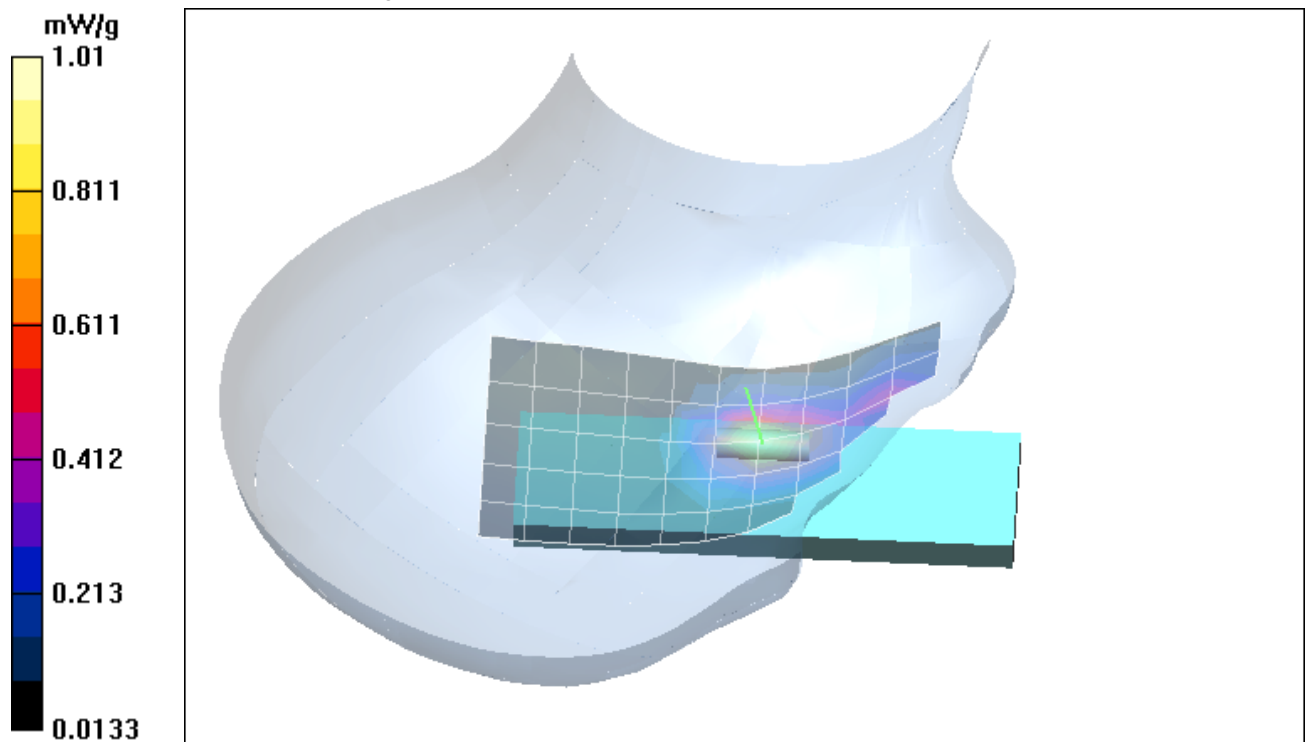


Fig. 8: SAR distribution for PCS 1900, channel 810, cheek position, right side of head. (December 01, 2003; Ambient Temperature: 20.3° C; Liquid Temperature : 19.2° C).

2 SAR Distribution Plots, PCS 1900 Body

Test Laboratory: IMST; File Name: [mghphm_1.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:4

Medium: Body1900 MHz ($\sigma = 1.5$ mho/m, $\epsilon_r = 51.7$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(4.8, 4.8, 4.8); Calibrated: 21.03.2003

- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

- Electronics: DAE3 Sn335; Calibrated: 05.05.2003

- Phantom: SAM TP:1176; ;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Unnamed procedure/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 19.9 V/m

Power Drift = -0.15 dB

Maximum value of SAR = 0.598 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.836 W/kg

SAR(1 g) = 0.52 mW/g; SAR(10 g) = 0.318 mW/g

Reference Value = 19.9 V/m

Power Drift = -0.15 dB

Maximum value of SAR = 0.549 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.501 W/kg

SAR(1 g) = 0.334 mW/g; SAR(10 g) = 0.219 mW/g

Reference Value = 19.9 V/m

Power Drift = -0.15 dB

Maximum value of SAR = 0.355 mW/g

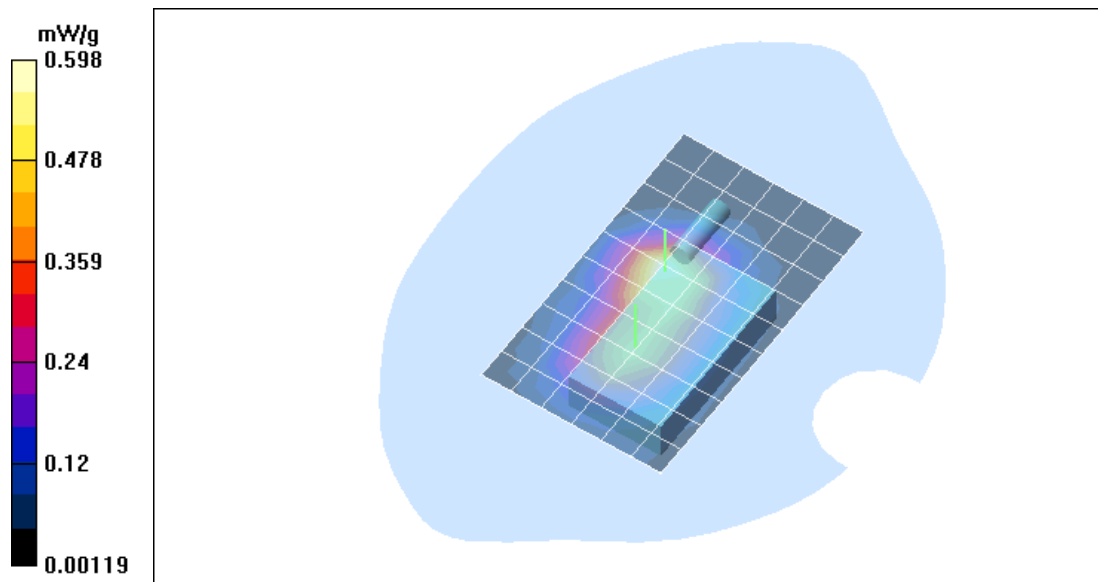


Fig. 9: SAR distribution for PCS 1900, channel 661, body worn configuration, 1.5 cm separation between mobile and phantom, antenna to the phantom, GPRS Class 10 (December 10, 2003; Ambient Temperature: 20.2° C; Liquid Temperature : 19.5° C).

Test Laboratory: IMST; File Name: [mghphm_3.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:4

Medium: Body 1900 MHz ($\sigma = 1.5 \text{ mho/m}$, $\epsilon_r = 51.7$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(4.8, 4.8, 4.8); Calibrated: 21.03.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 05.05.2003
- Phantom: SAM TP:1176; ;
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Unnamed procedure/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 11.2 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 0.255 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.343 W/kg

SAR(1 g) = 0.245 mW/g; SAR(10 g) = 0.164 mW/g

Reference Value = 11.2 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 0.26 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.285 W/kg

SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.12 mW/g

Reference Value = 11.2 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 0.207 mW/g

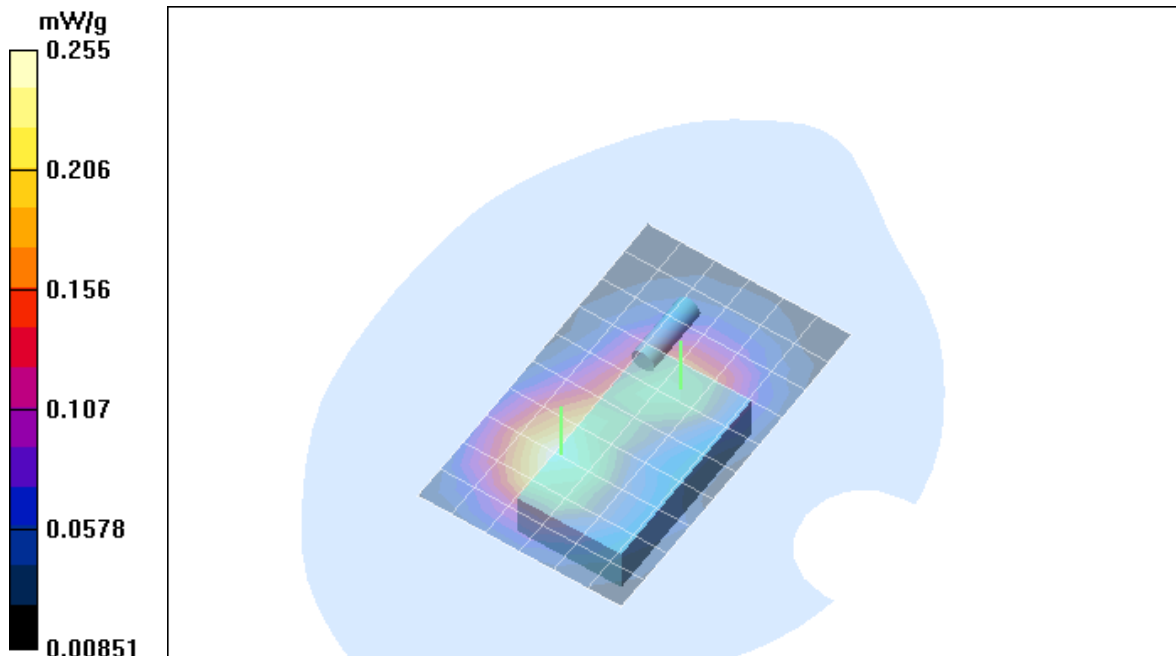


Fig. 10: SAR distribution for PCS 1900, channel 661, body worn configuration, 1.5 cm separation between mobile and phantom, antenna to the ground, GPRS Class 10 (December 10, 2003; Ambient Temperature: 20.2° C; Liquid Temperature : 19.5° C).

Test Laboratory: IMST; File Name: [mghphm_2.da4](#)

DUT: Mirrae;

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Body 1900 MHz ($\sigma = 1.5 \text{ mho/m}$, $\epsilon_r = 51.7$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(4.8, 4.8, 4.8); Calibrated: 21.03.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 05.05.2003
- Phantom: SAM TP:1176; ;
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Unnamed procedure/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 12 V/m

Power Drift = -0.1 dB

Maximum value of SAR = 0.227 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.363 W/kg

SAR(1 g) = 0.218 mW/g; SAR(10 g) = 0.134 mW/g

Reference Value = 12 V/m

Power Drift = -0.1 dB

Maximum value of SAR = 0.233 mW/g

Unnamed procedure/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.238 W/kg

SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.101 mW/g

Reference Value = 12 V/m

Power Drift = -0.1 dB

Maximum value of SAR = 0.163 mW/g

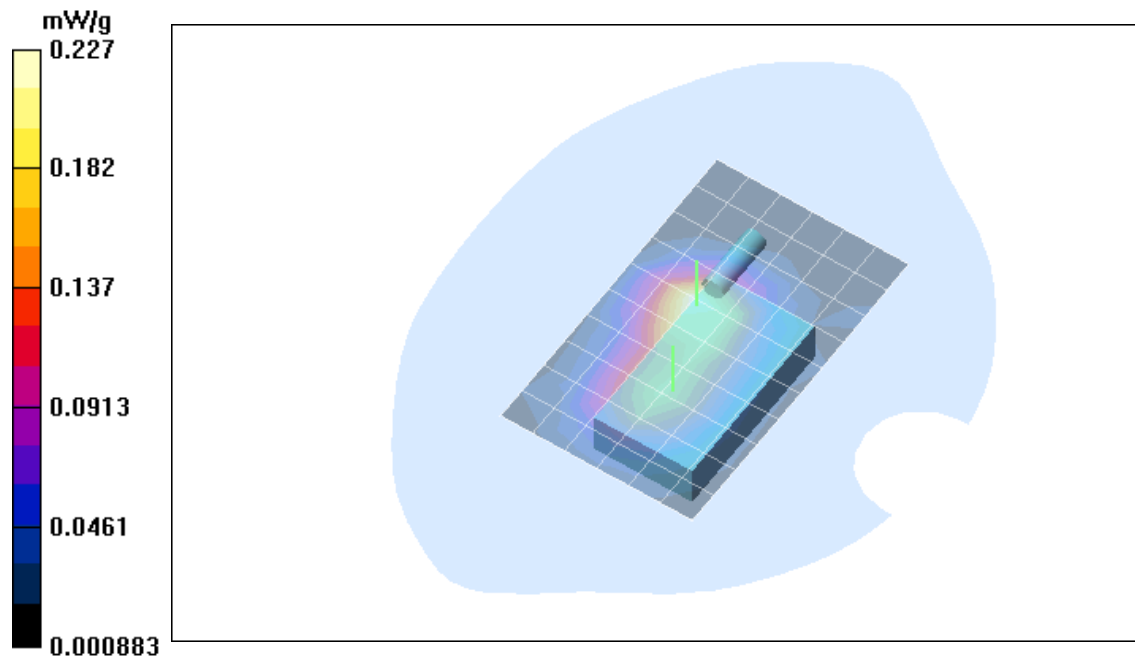


Fig. 11: SAR distribution for PCS 1900, channel 661, body worn configuration, 1.5 cm separation between mobile and phantom, antenna to the phantom, GSM mode (December 10, 2003; Ambient Temperature: 20.2° C; Liquid Temperature : 19.5° C).

3 SAR z-axis scans (Validation)

The following pictures show the plots of SAR versus liquid depth for the worst case values.

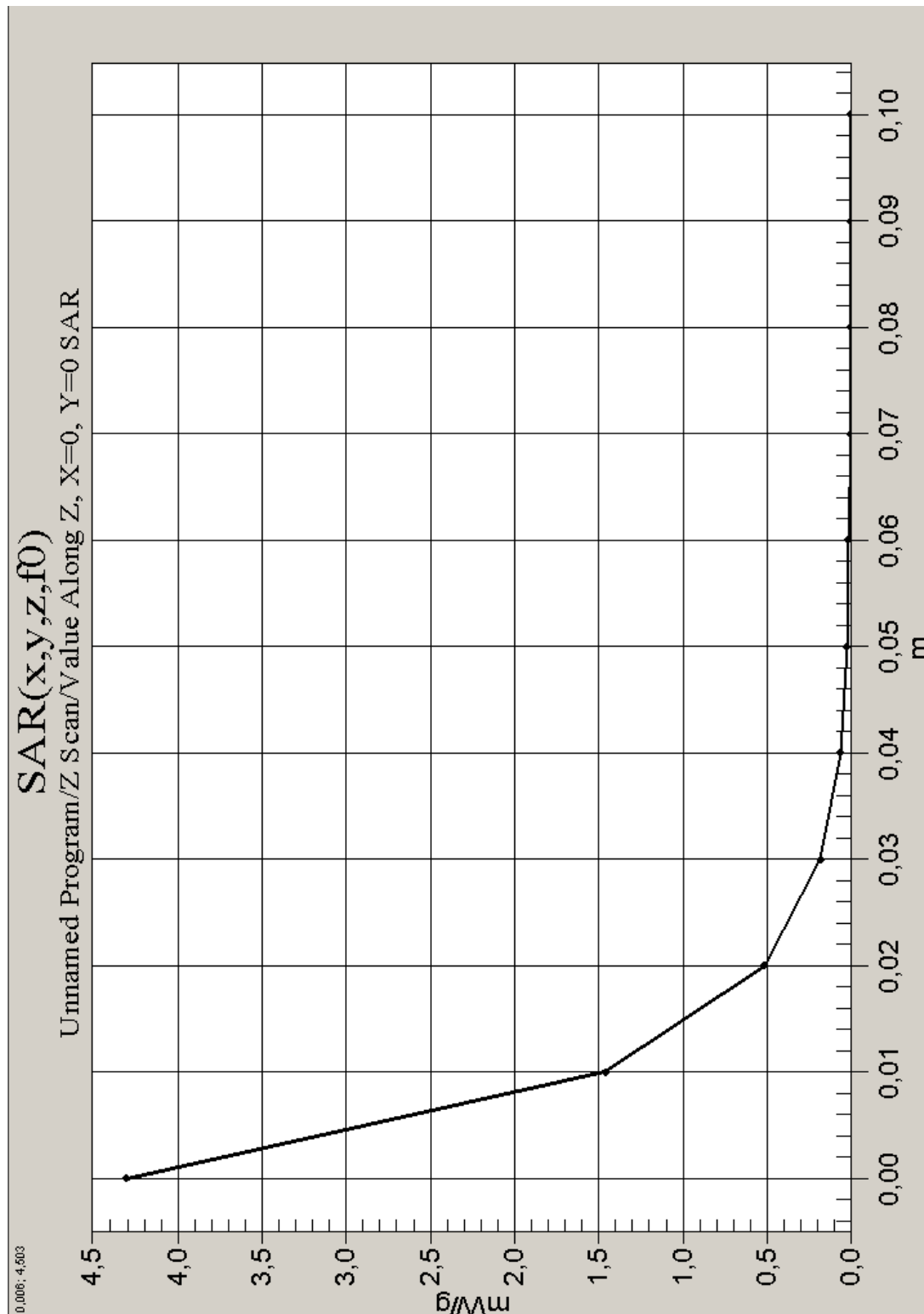


Fig. 12: SAR versus liquid depth, 1900 MHz, head (December 01, 2003; Ambient Temperature: 20.5° C; Liquid Temperature : 19.4° C).

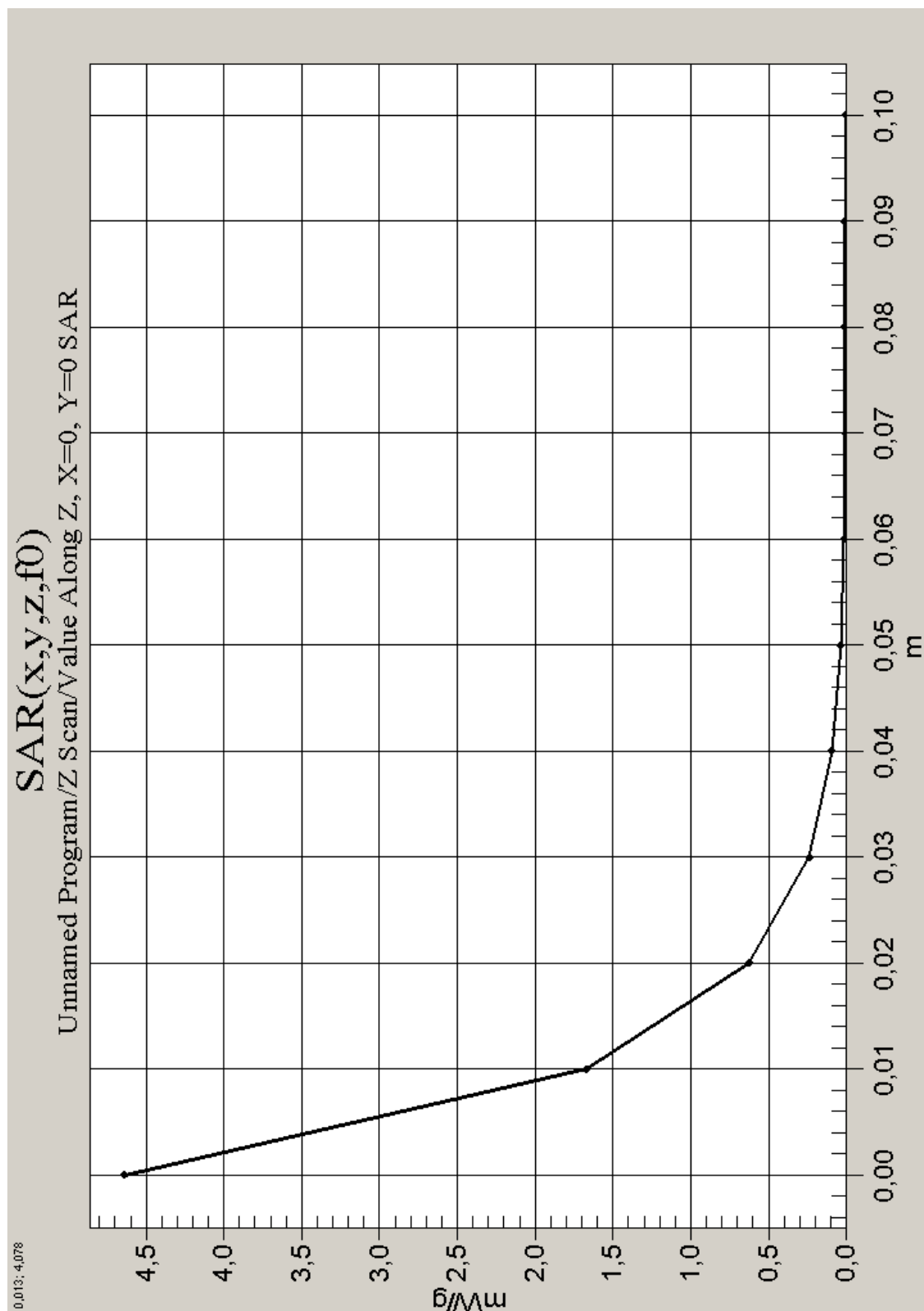


Fig. 13: SAR versus liquid depth, 1900 MHz, body (December 10, 2003; Ambient Temperature: 20.2° C; Liquid Temperature : 19.5° C).

4 SAR z-axis scans (Measurements)

The following pictures show the plots of SAR versus liquid depth for the worst case values.

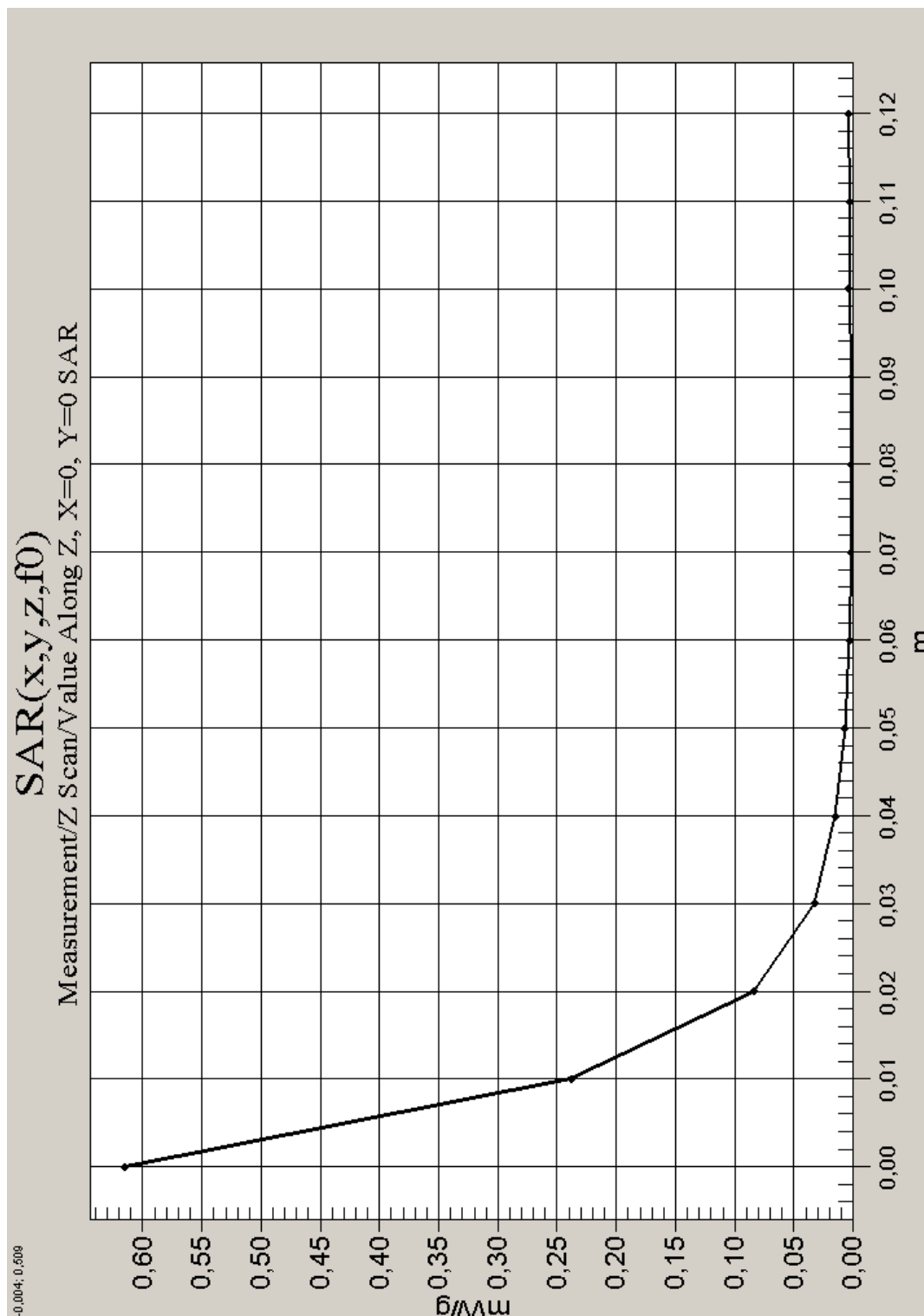


Fig. 14: SAR versus liquid depth, head: GSM 1900, channel 512, cheek position, left side of head (December 01, 2003; Ambient Temperature: 20.3° C; Liquid Temperature : 19.4° C).

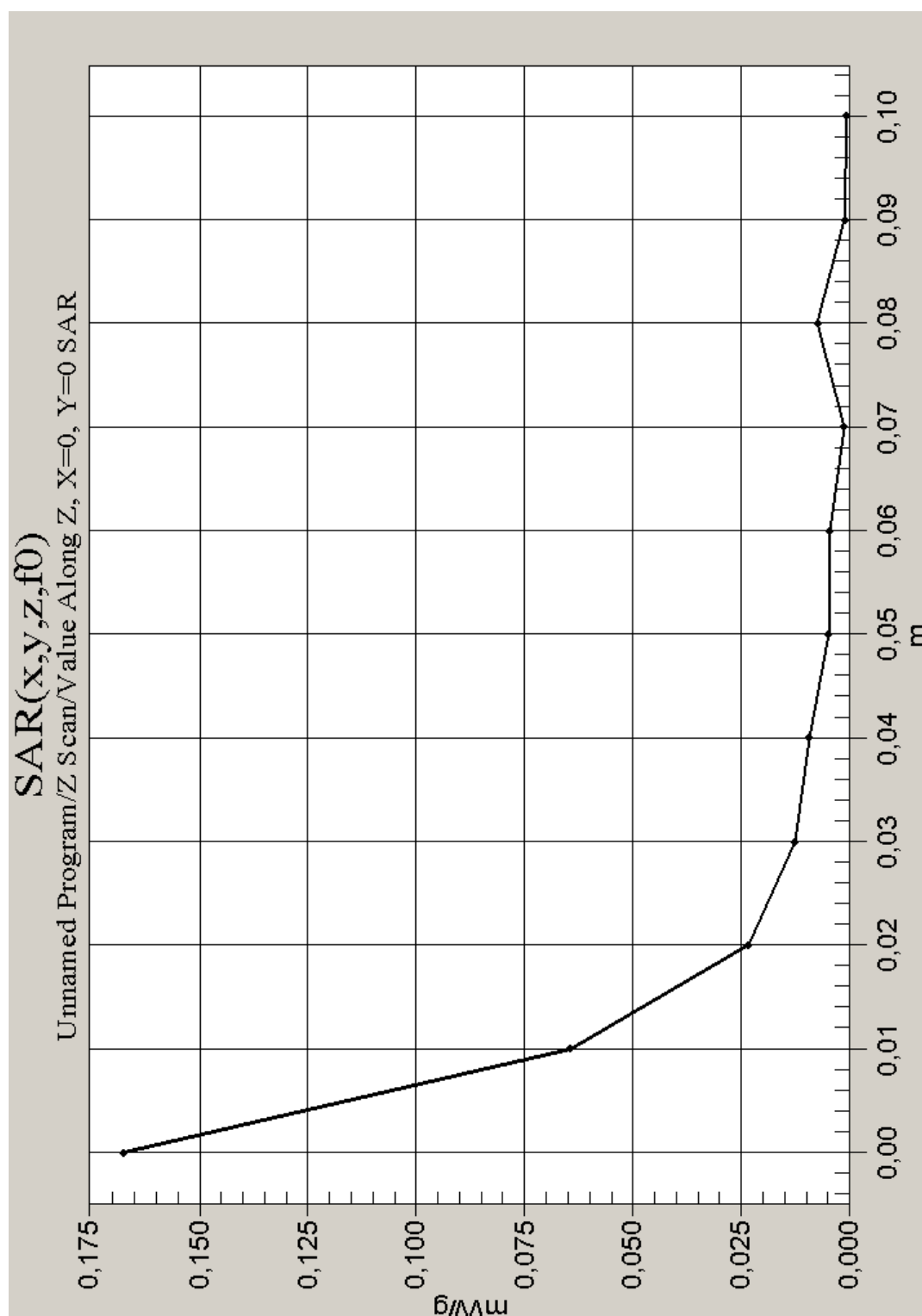


Fig. 15: SAR versus liquid depth, body: GSM 1900, channel 661, wit 1.5 cm separation between mobile and phantom, antenna towards the phantom, GPRS Class 10, (December 10, 2003; Ambient Temperature: 20.2° C; Liquid Temperature : 19.5° C).