
Appendix for the Report

Dosimetric Assessment of the BenQ Siemens EF81 (FCC ID: PWX-EF81)

According to the FCC Requirements

SAR Distribution Plots

January 16, 2006
IMST GmbH
Carl-Friedrich-Gauß-Str. 2
D-47475 Kamp-Lintfort

Customer
BenQ Denmark AsP
Siemens Kaj 1
DK-9400 Norresundby

The test results only relate to the items tested.
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1 SAR Distribution Plots, PCS 1900 Head

Test Laboratory: Imst GmbH; File Name: [yplm_1.da4](#)

DUT: BenQ EF 81; Type: open;

Program Name: Cheek Left

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(5.11, 5.11, 5.11); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 17.03.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.424 mW/g

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

Reference Value = 5.85 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.732 W/kg

SAR(1 g) = 0.393 mW/g; SAR(10 g) = 0.227 mW/g

Maximum value of SAR (measured) = 0.425 mW/g

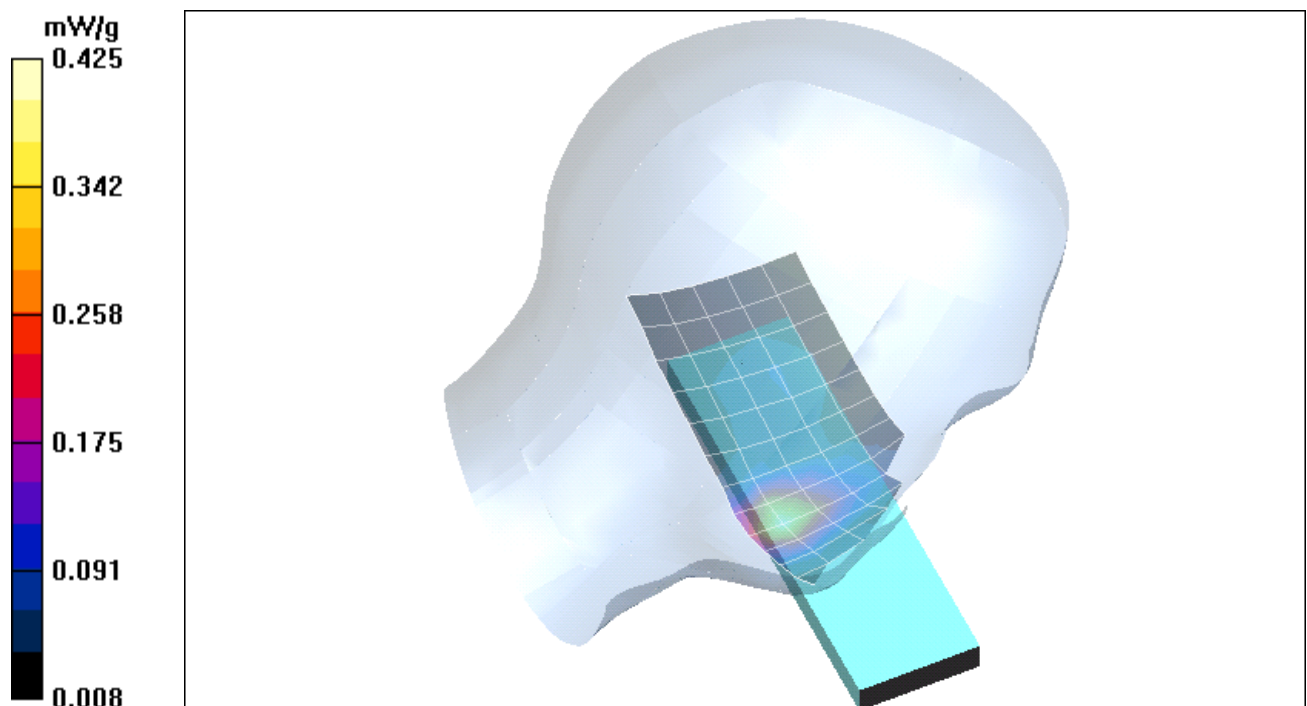


Fig. 1: SAR distribution for PCS 1900, channel 661, cheek position, left side of head (January 06, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

Test Laboratory: Imst GmbH; **File Name:** [yplm_2.da4](#)

DUT: BenQ EF 81; **Type:** open;

Program Name: Tilted Left

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(5.11, 5.11, 5.11); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 17.03.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.131 mW/g

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

Reference Value = 9.82 V/m; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 0.196 W/kg

SAR(1 g) = 0.133 mW/g; SAR(10 g) = 0.082 mW/g

Maximum value of SAR (measured) = 0.142 mW/g

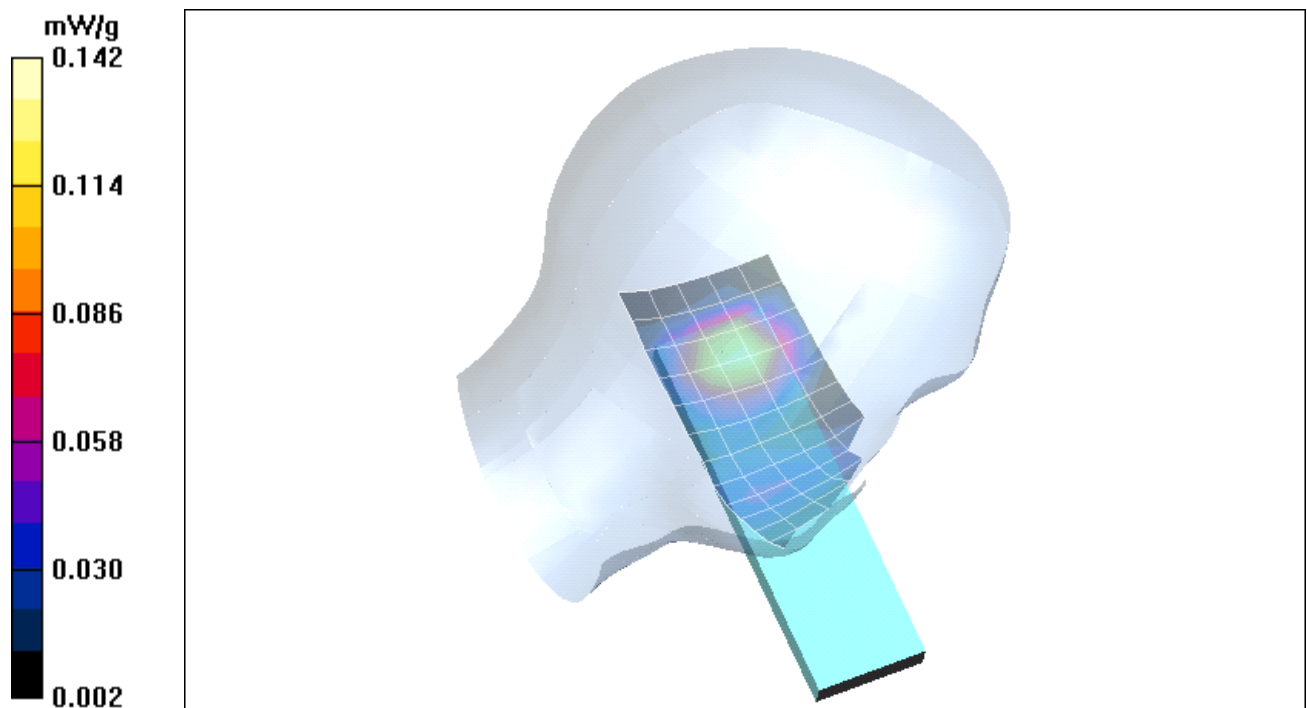


Fig. 2: SAR distribution for PCS 1900, channel 661, tilted position, left side of head (January 06, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

Test Laboratory: Imst GmbH; File Name: [yprm_1.da4](#)

DUT: BenQ EF 81; Type: open;

Program Name: Cheek Right

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(5.11, 5.11, 5.11); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 17.03.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek Right/Area Scan (6x14x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (measured) = 0.217 mW/g

Cheek Right/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.17 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 0.296 W/kg

SAR(1 g) = 0.207 mW/g; SAR(10 g) = 0.137 mW/g

Maximum value of SAR (measured) = 0.221 mW/g

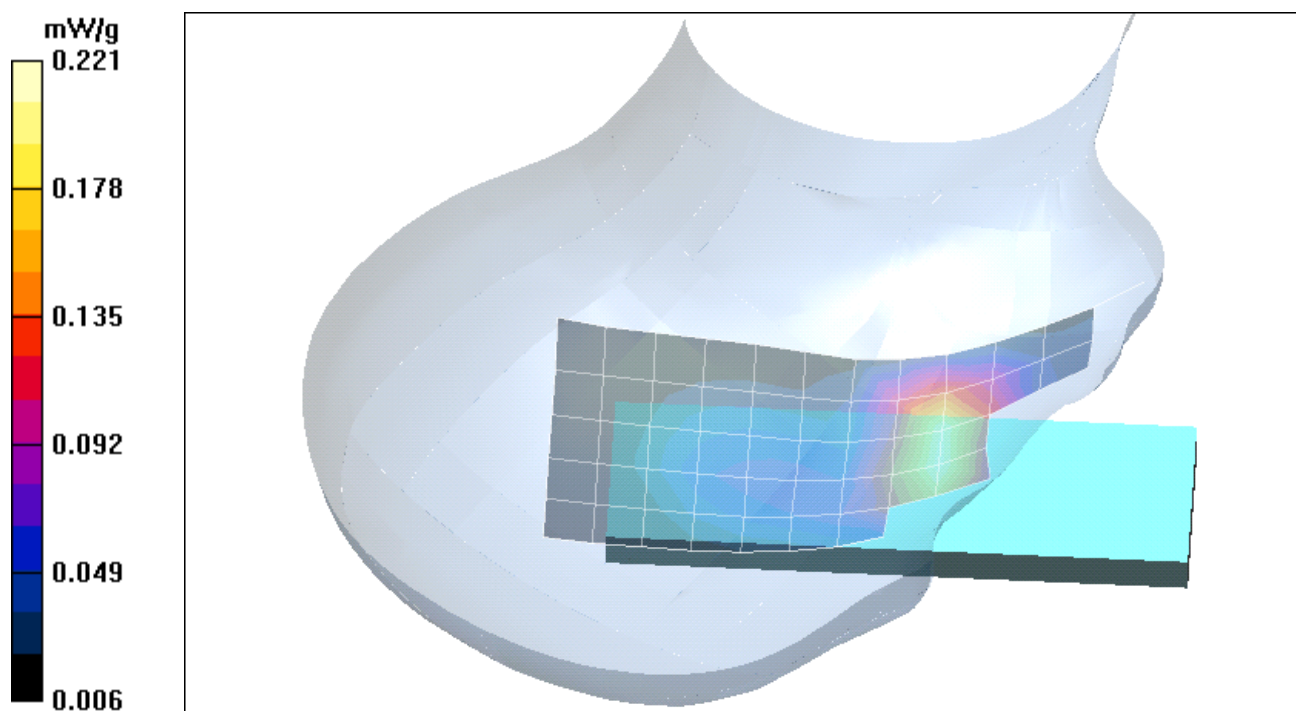


Fig. 3: SAR distribution for PCS 1900, channel 661, cheek position, right side of head (January 06, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

Test Laboratory: Imst GmbH; **File Name:** [yprm_2.da4](#)

DUT: BenQ EF 81; **Type:** open;

Program Name: Tilted Right

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(5.11, 5.11, 5.11); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 17.03.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.160 mW/g

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

Reference Value = 9.57 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 0.212 W/kg

SAR(1 g) = 0.146 mW/g; SAR(10 g) = 0.090 mW/g

Maximum value of SAR (measured) = 0.158 mW/g

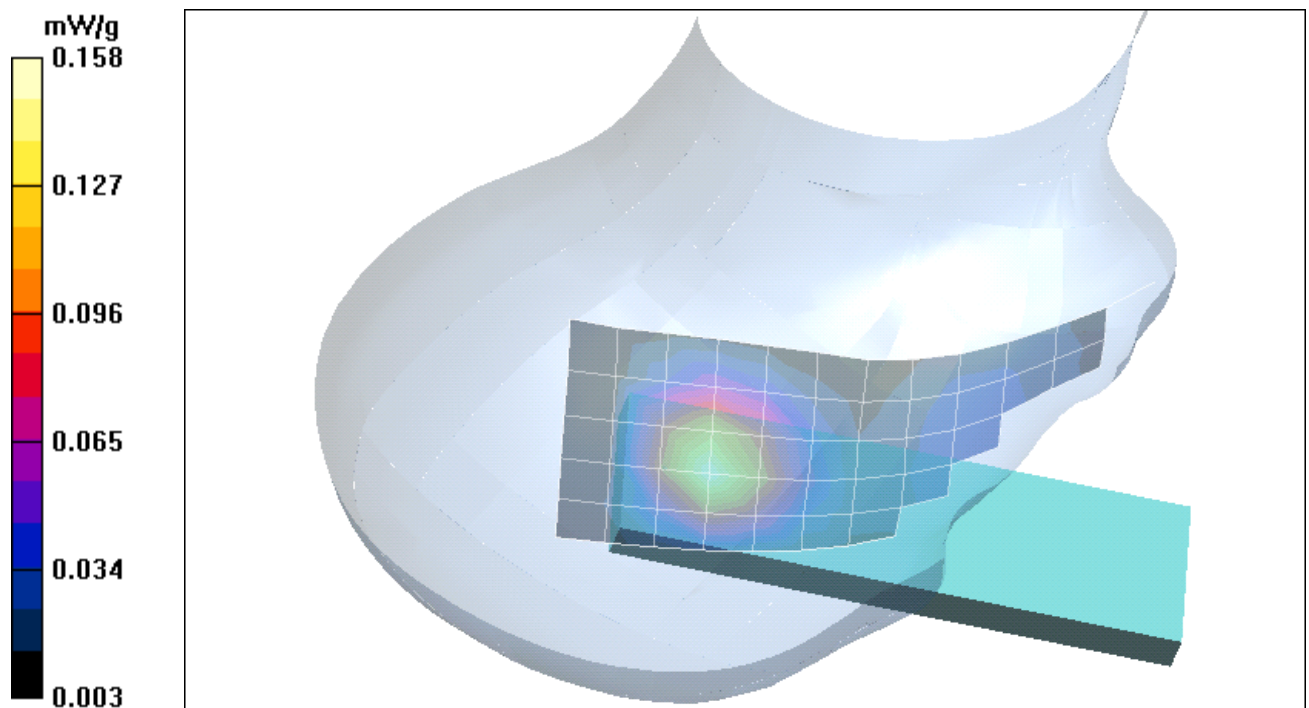


Fig. 4: SAR distribution for PCS 1900, channel 661, tilted position, right side of head (January 06, 2006; Ambient Temperature: 21.5 °C; Liquid Temperature: 20.4°C)

2 SAR Distribution Plots, PCS 1900 Head with Bluetooth activated

Test Laboratory: Imst GmbH; File Name: [yplm_1_Bt.da4](#)

DUT: BenQ EF 81; Type: open;

Program Name: Cheek Left

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(5.11, 5.11, 5.11); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 17.03.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.387 mW/g

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

Reference Value = 4.40 V/m; Power Drift = 0.162 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.418 mW/g; SAR(10 g) = 0.221 mW/g

Maximum value of SAR (measured) = 0.455 mW/g

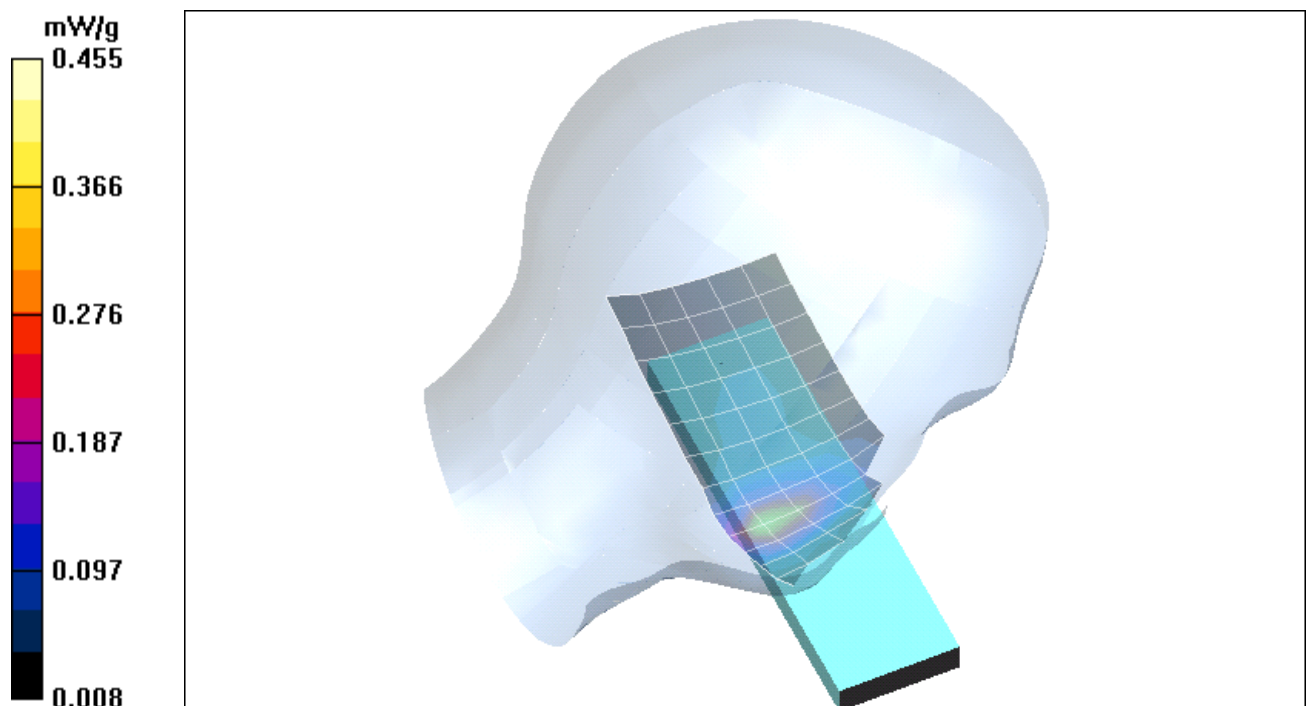


Fig. 5: SAR distribution for PCS 1900, channel 661, cheek position, left side of head (January 06, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

3 SAR Distribution Plots, PCS 1900 Body with headset in GSM mode

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [bphm_8.da4](#)

DUT: BenQ EF81; Type: closed;

Program Name: Body Worn

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.52, 4.52, 4.52); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.342 mW/g

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

Reference Value = 6.11 V/m; Power Drift = -0.126 dB

Peak SAR (extrapolated) = 0.658 W/kg

SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.204 mW/g

Maximum value of SAR (measured) = 0.426 mW/g

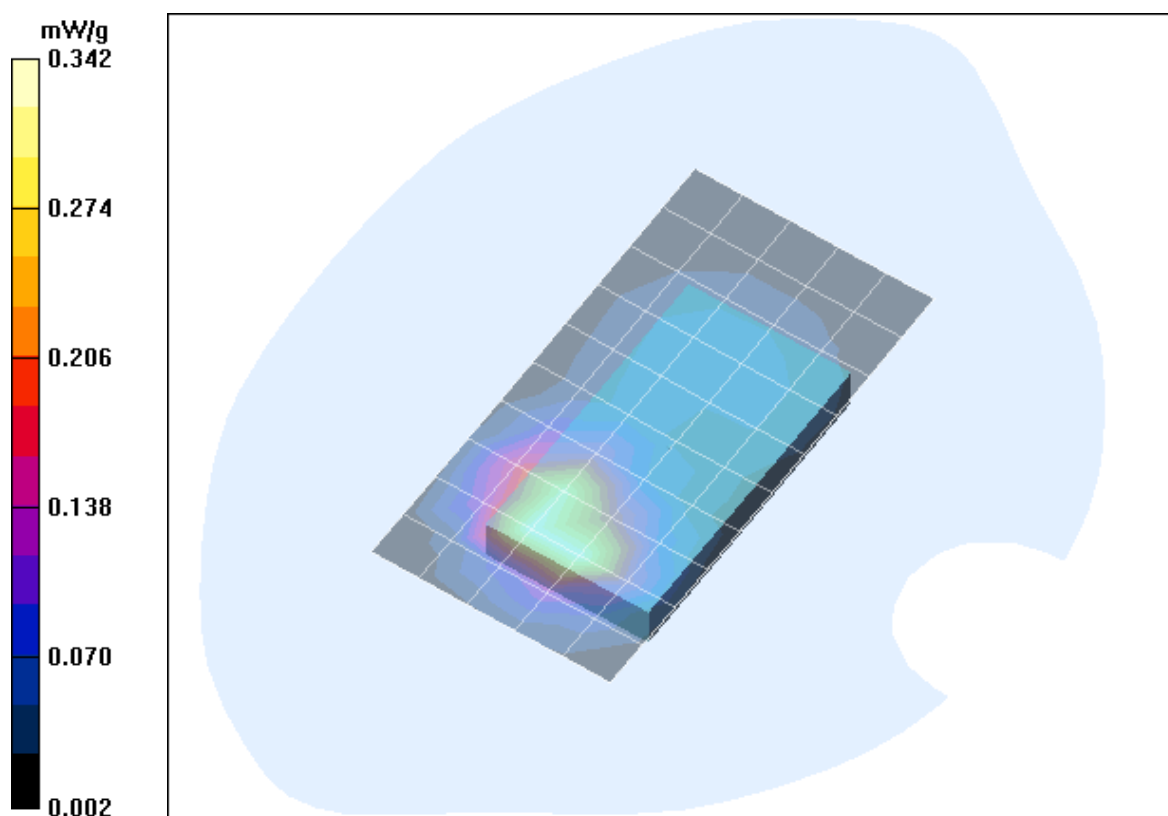


Fig. 6: SAR distribution for PCS 1900, channel 661, body worn configuration, antenna towards the phantom, with headset and FCL 160 carry case with 8 mm distance (January 10, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [bphm_11.da4](#)

DUT: BenQ EF81; Type: closed;

Program Name: Body Worn

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.52, 4.52, 4.52); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.236 mW/g

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

Reference Value = 7.82 V/m; Power Drift = 0.125 dB

Peak SAR (extrapolated) = 0.367 W/kg

SAR(1 g) = 0.218 mW/g; SAR(10 g) = 0.122 mW/g

Maximum value of SAR (measured) = 0.243 mW/g

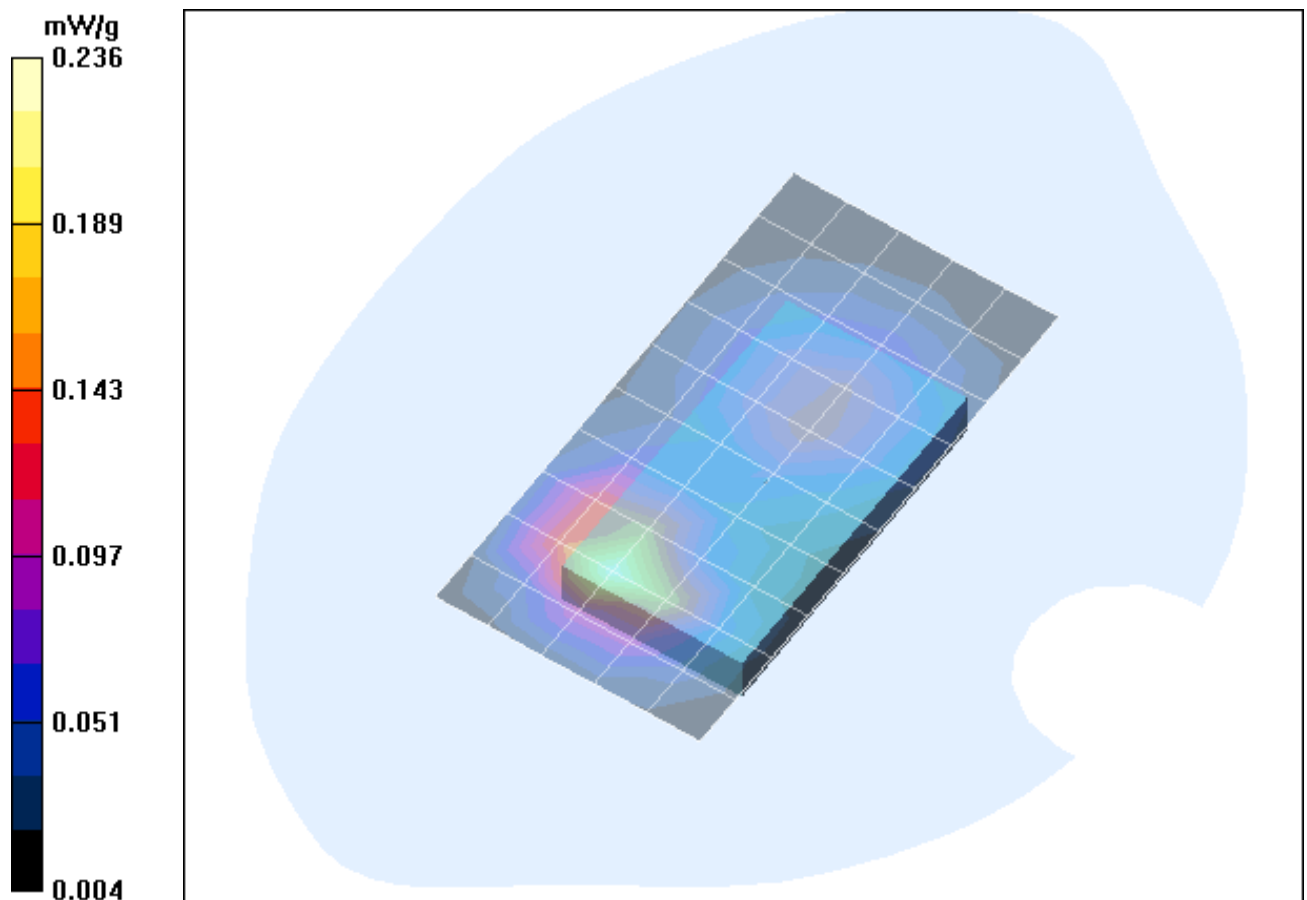


Fig. 7: SAR distribution for PCS 1900, channel 661, body worn configuration, antenna towards the phantom, with headset and FCL 170 carry case with 15 mm distance (January 10, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

4 SAR Distribution Plots, PCS 1900 Body with data cable in GPRS mode

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [bphm_12.da4](#)

DUT: BenQ EF81; Type: closed;

Program Name: Body Worn

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.52, 4.52, 4.52); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.484 mW/g

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

Reference Value = 3.41 V/m; Power Drift = 0.093 dB

Peak SAR (extrapolated) = 0.860 W/kg

SAR(1 g) = 0.532 mW/g; SAR(10 g) = 0.306 mW/g

Maximum value of SAR (measured) = 0.590 mW/g

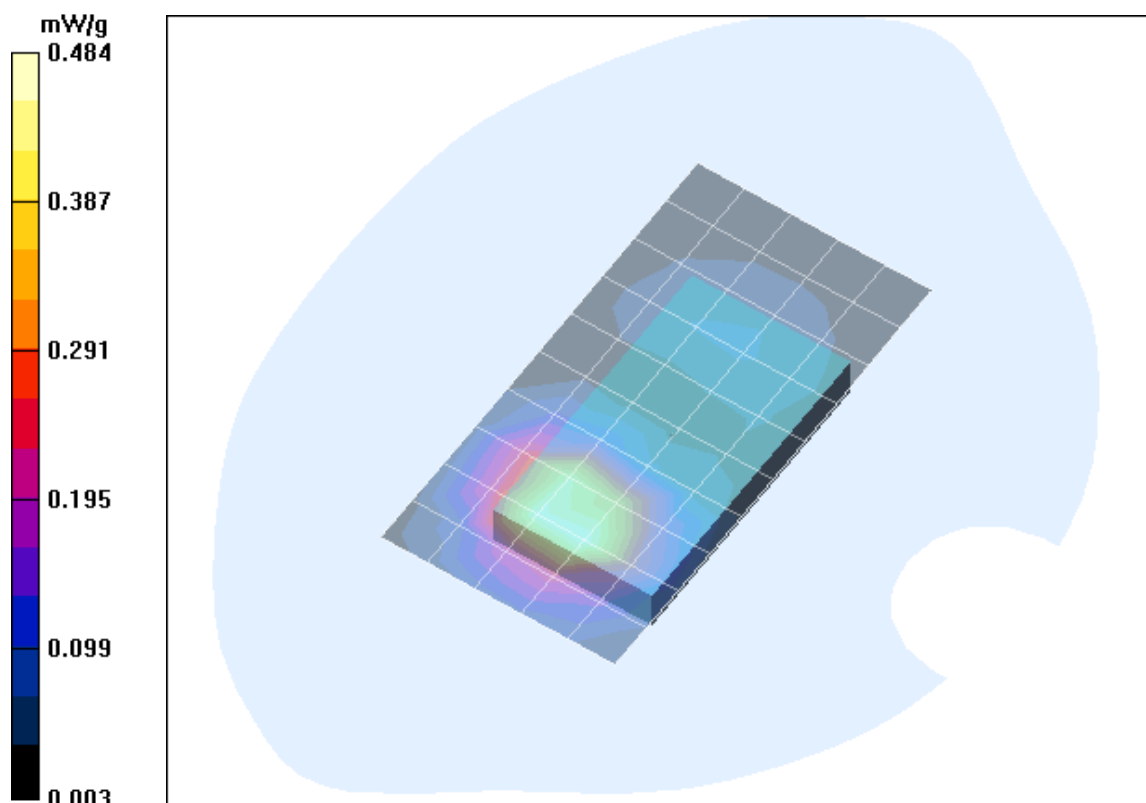


Fig. 8: SAR distribution for GPRS 1900, channel 661, body worn configuration, antenna towards the phantom, with data cable and FCL 170 carry case with 15 mm distance (January 10, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

5 SAR Distribution Plots, PCS 1900 Body with data cable in GPRS mode and Bluetooth activated

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [bphm_10.da4](#)

DUT: BenQ EF81; Type: closed;

Program Name: Body Worn

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.52, 4.52, 4.52); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

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

Maximum value of SAR (measured) = 0.494 mW/g

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

Reference Value = 10.0 V/m; Power Drift = -0.088 dB

Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 0.517 mW/g; SAR(10 g) = 0.239 mW/g

Maximum value of SAR (measured) = 0.501 mW/g

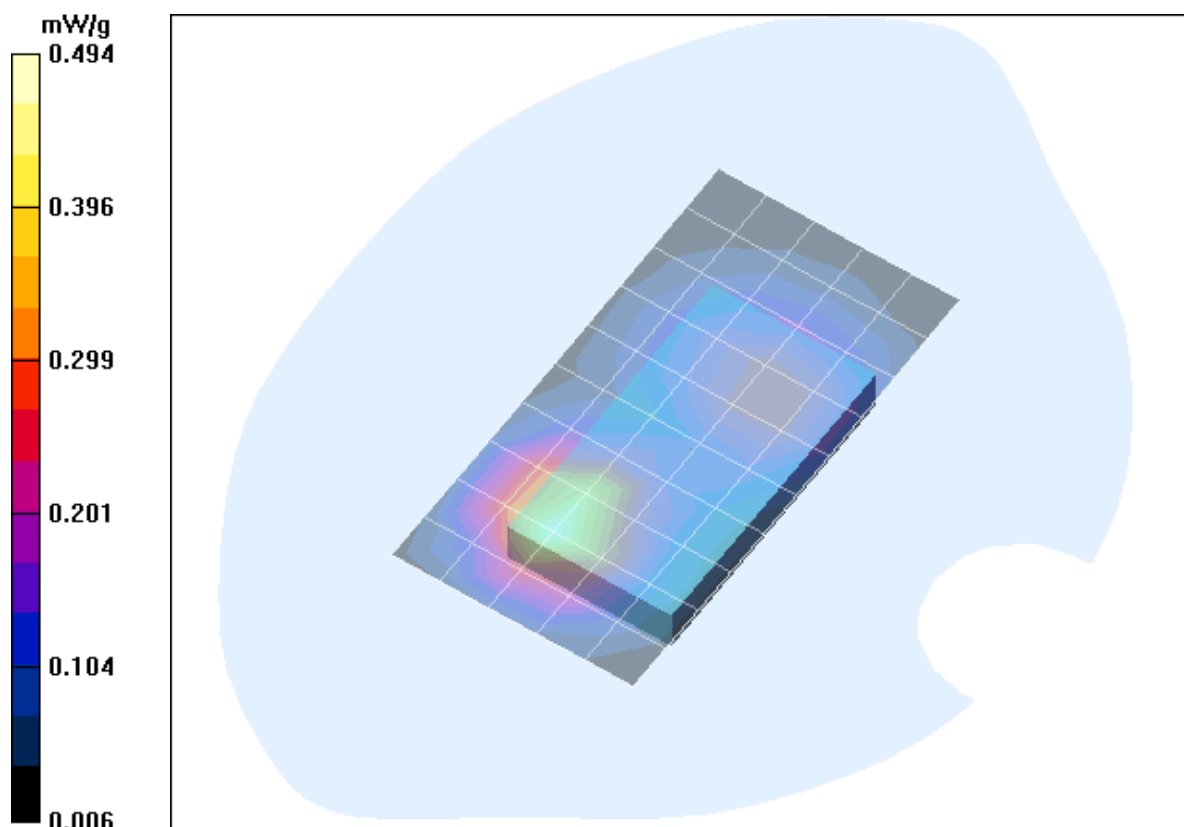


Fig. 9: SAR distribution for GPRS 1900, channel 661, body worn configuration, antenna towards the phantom, with data cable and FCL 160 carry case with 8 mm distance (January 10, 2006; Ambient Temperature: 21.5° C; Liquid Temperature: 20.4° C).

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [bphm_13.da4](#)

DUT: BenQ EF81; Type: closed;

Program Name: Body Worn

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.52, 4.52, 4.52); Calibrated: 13.01.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

Body Worn/Area Scan (6x11x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (measured) = 0.460 mW/g

Body Worn/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 15.3 V/m; Power Drift = -0.123 dB

Peak SAR (extrapolated) = 0.717 W/kg

SAR(1 g) = 0.433 mW/g; SAR(10 g) = 0.246 mW/g

Maximum value of SAR (measured) = 0.477 mW/g

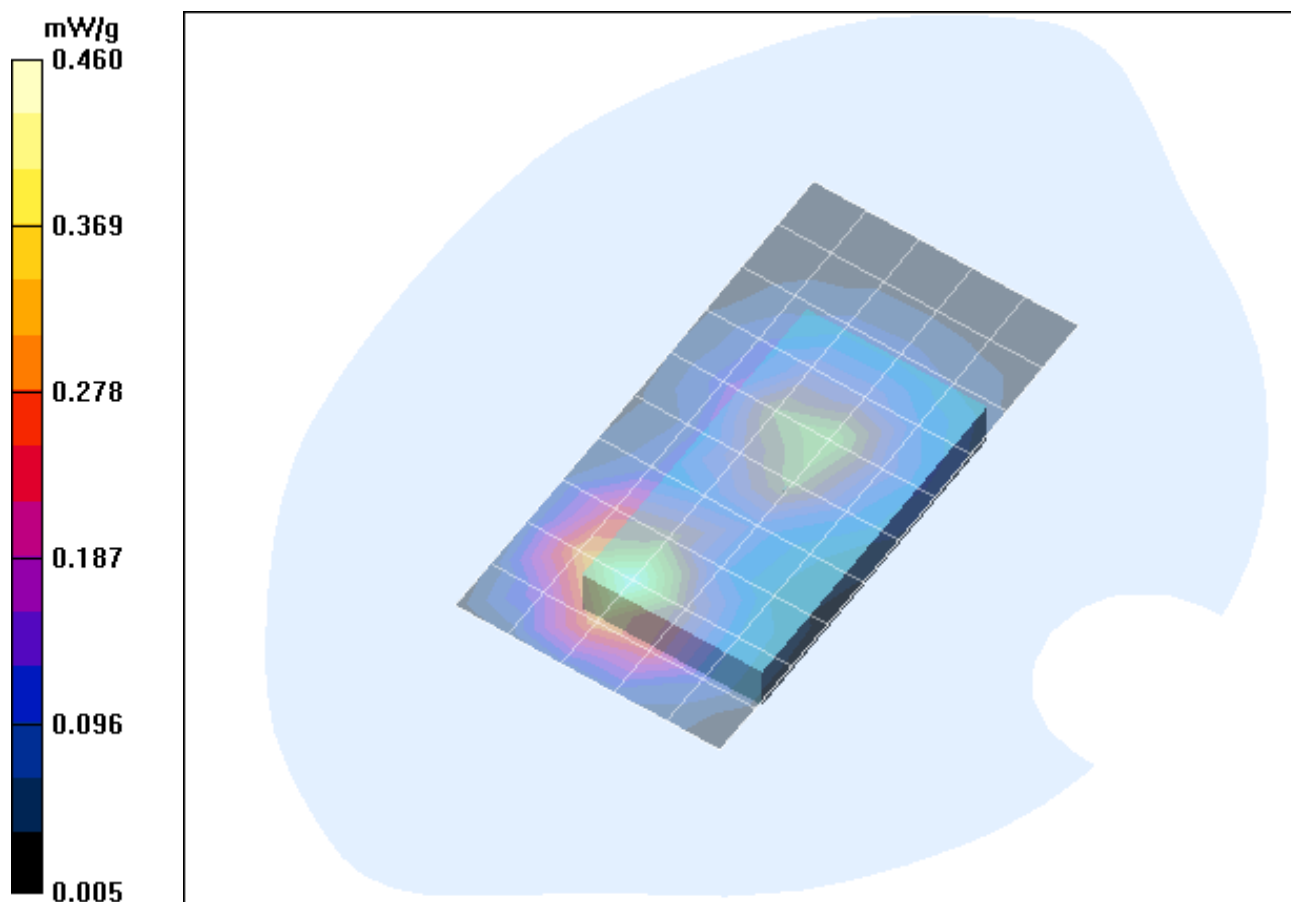


Fig. 10: SAR distribution for GPRS 1900, channel 661, body worn configuration, antenna towards the phantom, with data cable and FCL 170 carry case with 15 mm distance (January 10, 2006; Ambient Temperature: 21.5° C; Liquid Temperature: 20.4° C).

6 SAR Distribution Plots, PCS 1900 Body in GPRS mode, PTT

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [bphm_19.da4](#)

DUT: BenQ EF 81; Type: open;

Program Name: Body Worn

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.52, 4.52, 4.52); Calibrated: 13.01.2005

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

- Electronics: DAE4 Sn631; Calibrated: 07.07.2005

- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176

- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

Body Worn/Area Scan (6x15x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.231 mW/g

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

Reference Value = 8.67 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 0.330 W/kg

SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.139 mW/g

Maximum value of SAR (measured) = 0.244 mW/g

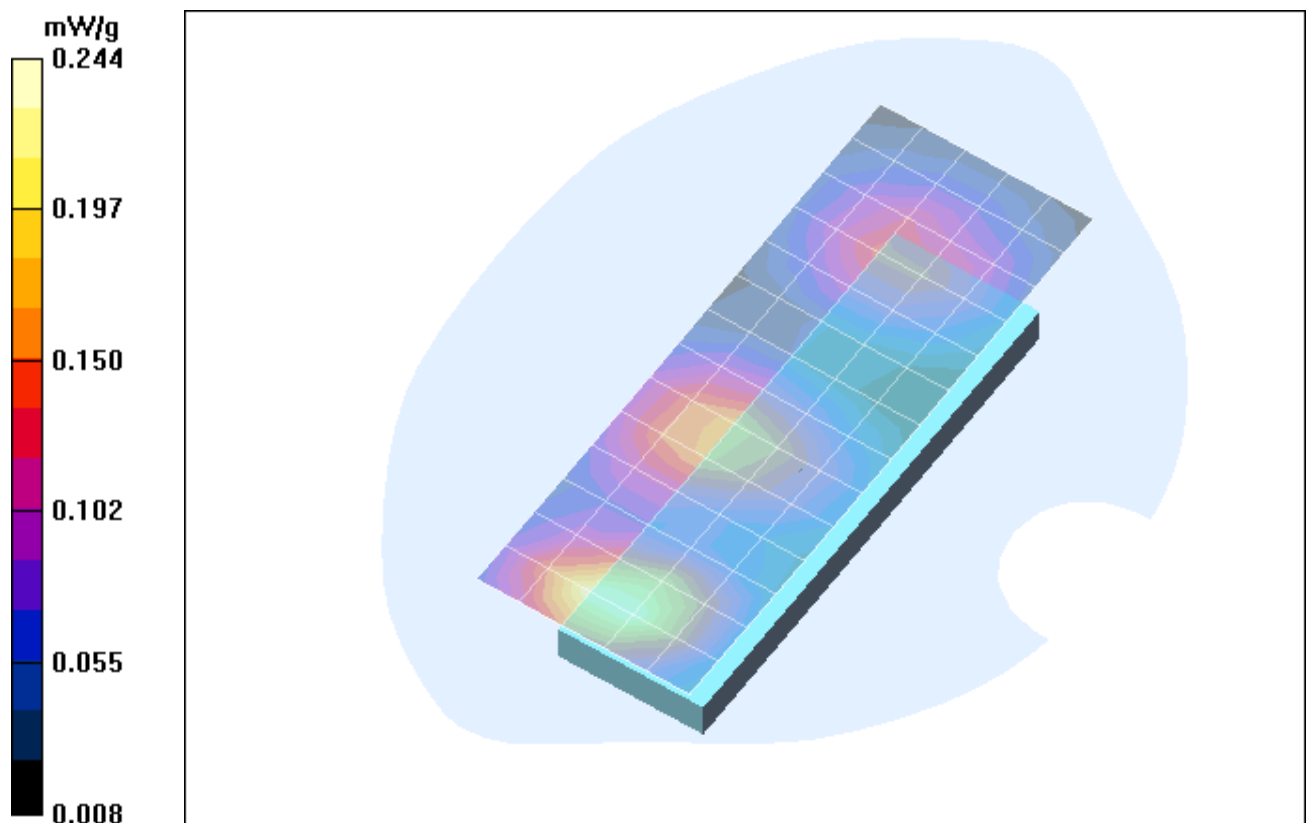


Fig. 11: SAR distribution for GPRS 1900, channel 661, body worn configuration, display towards the phantom, PTT configuration with 25 mm distance (January 10, 2006; Ambient Temperature: 21.5° C; Liquid Temperature: 20.4° C).

7 SAR z-axis scans (Validation)

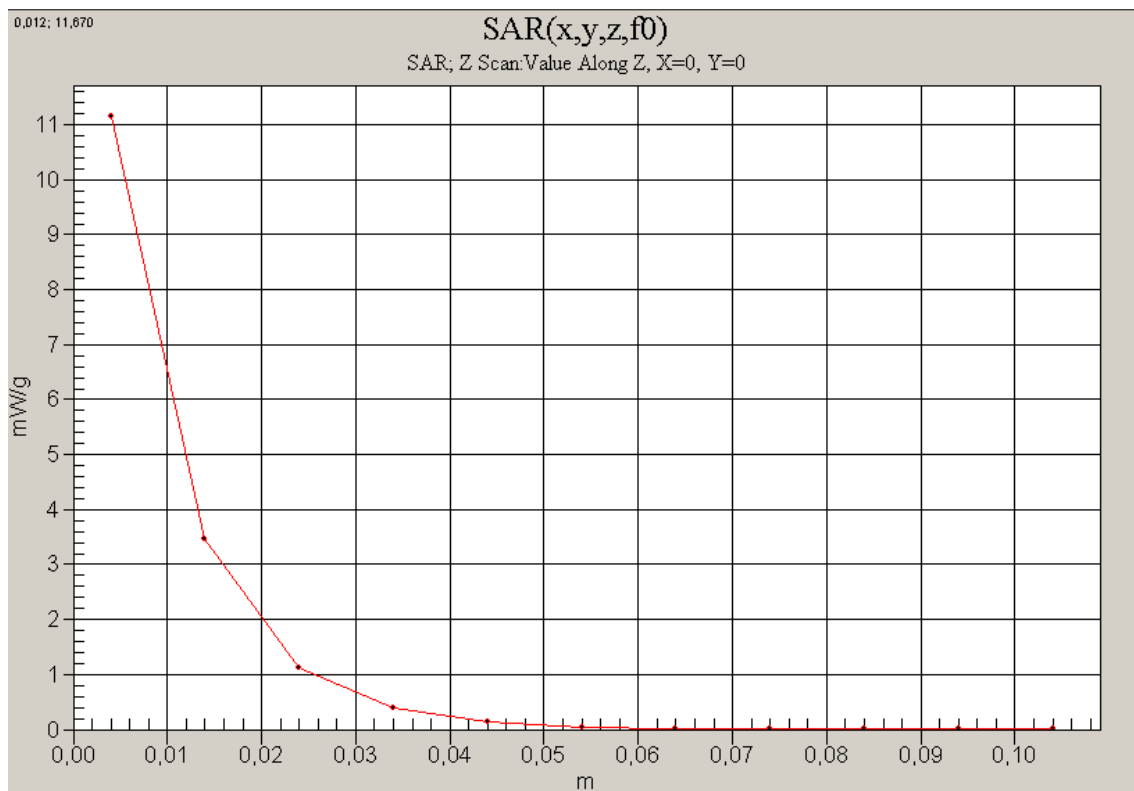


Fig. 12: SAR versus liquid depth, 1900 MHz, head (January 06, 2006; Ambient Temperature: 21.1°C; Liquid Temperature: 20.5°C).

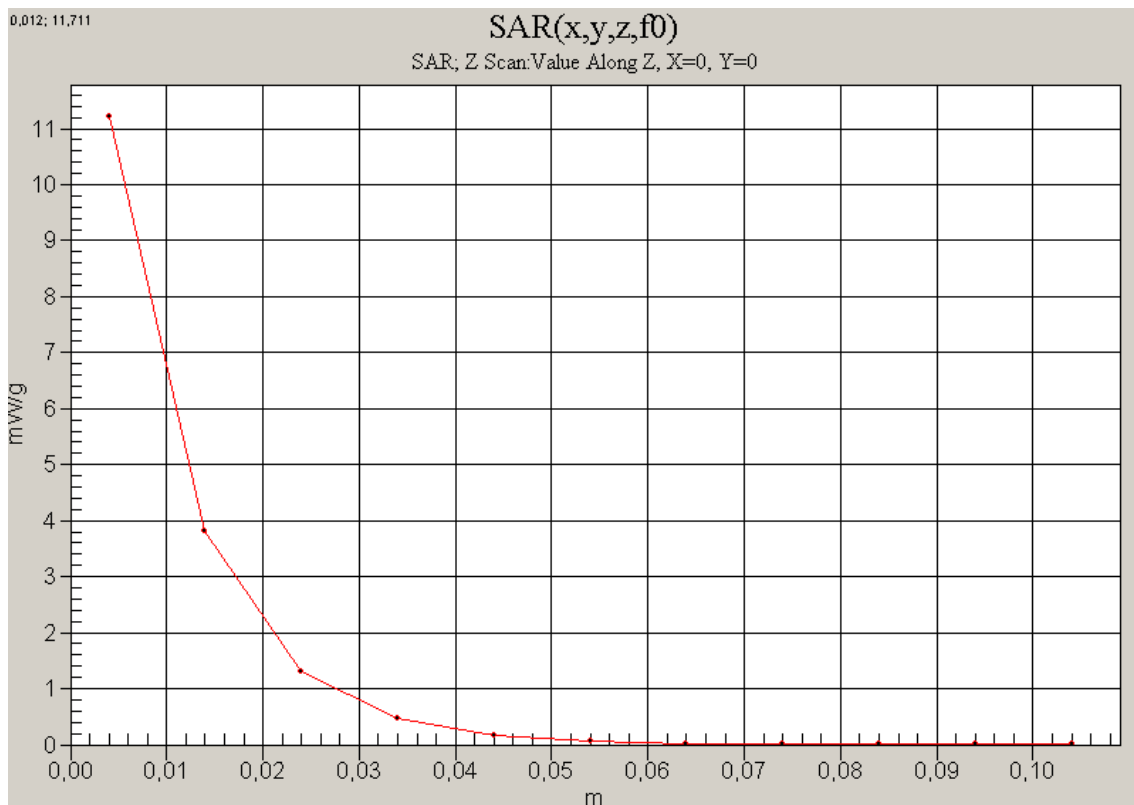


Fig. 13: SAR versus liquid depth, 1900 MHz, body (January 10, 2006; Ambient Temperature: 21.0°C; Liquid Temperature: 20.5°C).

8 SAR z-axis scans (Measurements)

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

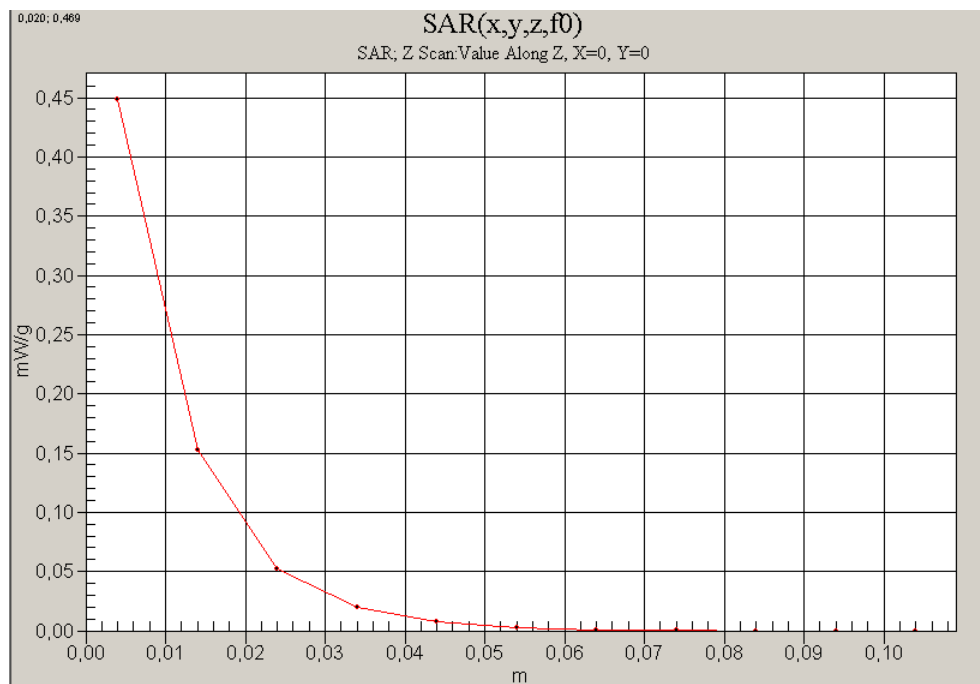


Fig. 14: SAR versus liquid depth, head: PCS 1900, channel 661, cheek position, left side of head, Bluetooth activated (January 06, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).

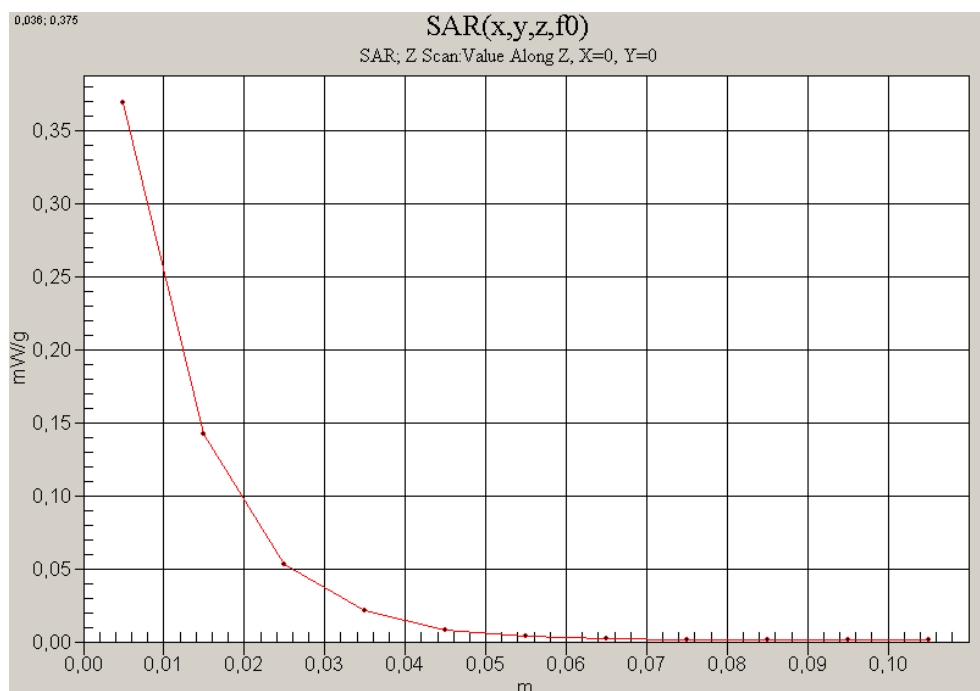


Fig. 15: SAR versus liquid depth, body: GPRS 1900, channel 661, data cable and FCL 170 carry case (January 10, 2006; Ambient Temperature: 21.5°C; Liquid Temperature: 20.4°C).