

April 4, 2003 by Prof. Gandhi

**RESPONSE TO FCC QUESTIONS ON THE SAR REPORT FOR AMBIT
MICROSYSTEMS 802.11 a/b/g MINI PCI BUILT INTO AGENCY SERIES
PP2170 LAPTOP COMPUTER**

FCC ID# J07H06901

SAR Report originally submitted: February 19, 2003

1. Details of BT transmitter mentioned on page 26.

Response:

A wrong photograph was attached as Fig. 2 on p. 26 of the previously submitted SAR test report. This device does not have a blue tooth antenna and none should, therefore, have been shown. A corrected version of Fig. 2 is attached herewith. We apologize for this mistake which occurred due to a miscommunication between various parties.

2. Additional probe calibration data to include axial and hemispherical isotropy, and linearity.

Response:

As previously mentioned in Section III, the isotropy of the probe was determined by rotating the probe around its axis. The isotropy of the probe was measured to be less than ± 0.23 dB ($\pm 5.5\%$). The linearity of the probe is the same as the deviation of the probe output from the square-law behavior. The linearity of the probe has been measured to be less than $\pm 3\%$.

3. Steps that are being taken to comply with Supplement C recommendation to perform system verification within 100 MHz of device frequency.

Response:

Since it is very hard to fabricate a half-wave dipole with a balun in the 5.0-5.8 GHz band, both because of fairly small dimensions as well as relatively limited bandwidth of such dipoles, we are developing a system verification system by using an open-ended, air-filled waveguide as an irradiation system placed at a distance of 8 mm from the base of the planar phantom (10 mm from the lossy fluid in the phantom). For this application, we have set up a WR 187 rectangular waveguide of internal dimensions $1.872" \times 0.872"$ that is fed with microwave power from a Hewlett Packard Model 83620A Synthesized Sweeper (10 MHz-20 GHz). The operating (TE₁₀ mode) band of this waveguide is from 3.95 to 5.85 GHz. When placed at a distance of 8 mm from the base of the planar phantom, the reflection coefficient is about 10-20%. Even this relatively small amount of reflection can be reduced to less than 0.5% by using a movable slide screw waveguide tuner (Narda Model 22CI). For system verification, we hope to compare the peak 1-g SAR with that obtained using the FDTD-calculated values for such a radiation system.

This work is likely to be completed in the next couple of weeks (first or second week of April 2003).

4. *Additional SAR measurement data to include values for both antennas A and B for all configurations; also plot of the entire device.*

Response:

All of the SAR data submitted previously (in the SAR Report dated February 19, 2003) pertained to Antenna B as shown in Fig. a. The additional data measured for Antenna A for all three configurations is added to the previously submitted Table 11 and is resubmitted here as Table a. As expected, the SARs are extremely low for Configuration 1 – Above-lap position. The coarse scan measurements for Configurations 2 and 3 for Antenna A are given in Figs. b and c, parts 1-4, respectively. The corresponding SAR distributions for the peak 1-g SAR regions are given in Tables b-i, respectively. The z-axis scan plots taken at the highest SAR locations for each for the configurations for Antenna A are given in Figs. d and e, respectively.

Plot of the Entire Device

A photograph of the top cover of the Agency Series Laptop Computer with display open as for Configuration 3 – End-on position is given in Fig. f. Marked here are the various regions 1-12 each of dimension 5.6×8.0 cm that have been individually scanned for SAR distributions with a coarse scan resolution of 0.8 cm (8 mm) each. The locations of the individual scan regions on the Agency Series PC Cover of dimensions 28×23 cm are given in Fig. g.

Since the measured peak 1-g SAR was the highest (0.416 W/kg) for Antenna B for Configuration 3 – End-on position for an irradiation frequency of 5.26 GHz in the base mode, all 12 regions were scanned for the SAR values at a depth of 4 mm in the phantom fluid for the Ambit Microsystems Wireless Antenna B in the base mode at 5.26 GHz. Given in Figs. h to s are the measured SAR distributions for regions 1-12, respectively. For convenience of comparison, all of the measured SAR distributions are shown with the color scale as that in Fig. h for region 1. Also included are the measured SAR distributions for all 12 regions given as Tables j-u, respectively. As expected, the SARs are the highest for region 1 in close proximity to Antenna B. Even for this region 1, the highest SAR region is highly localized occupying an area of approximately 2×2.5 cm in physical extent.

5. *New SAR plots to include the following information:*

Date:	March 27, 2003
Liquid parameters:	Same as those given in Section V of the SAR test report dated February 19, 2003.
Device positions and set up:	Given in various Figs. b, c, parts 1-4, respectively,
Probe conversion factor:	Same as for the previous SAR test report; $2.98 \text{ (mW/kg)}/\mu\text{V}$.

SAR system verification: The new data taken for the SAR system verification is attached here as Appendix I. The data for system verification was March 26, 2003. The measured 1-g SAR of 36.429 W/kg is in excellent agreement with the FDTD-calculated 1-g SAR of 35.8 W/kg. Also as expected, the measured SAR plot is quite symmetric.

6. *There is a typographical error on p. 15 for fine scan measurements. As given in Figs. 13b and 14b for coarse scans, the frequency should be 5.785 rather than 5.875 GHz.*

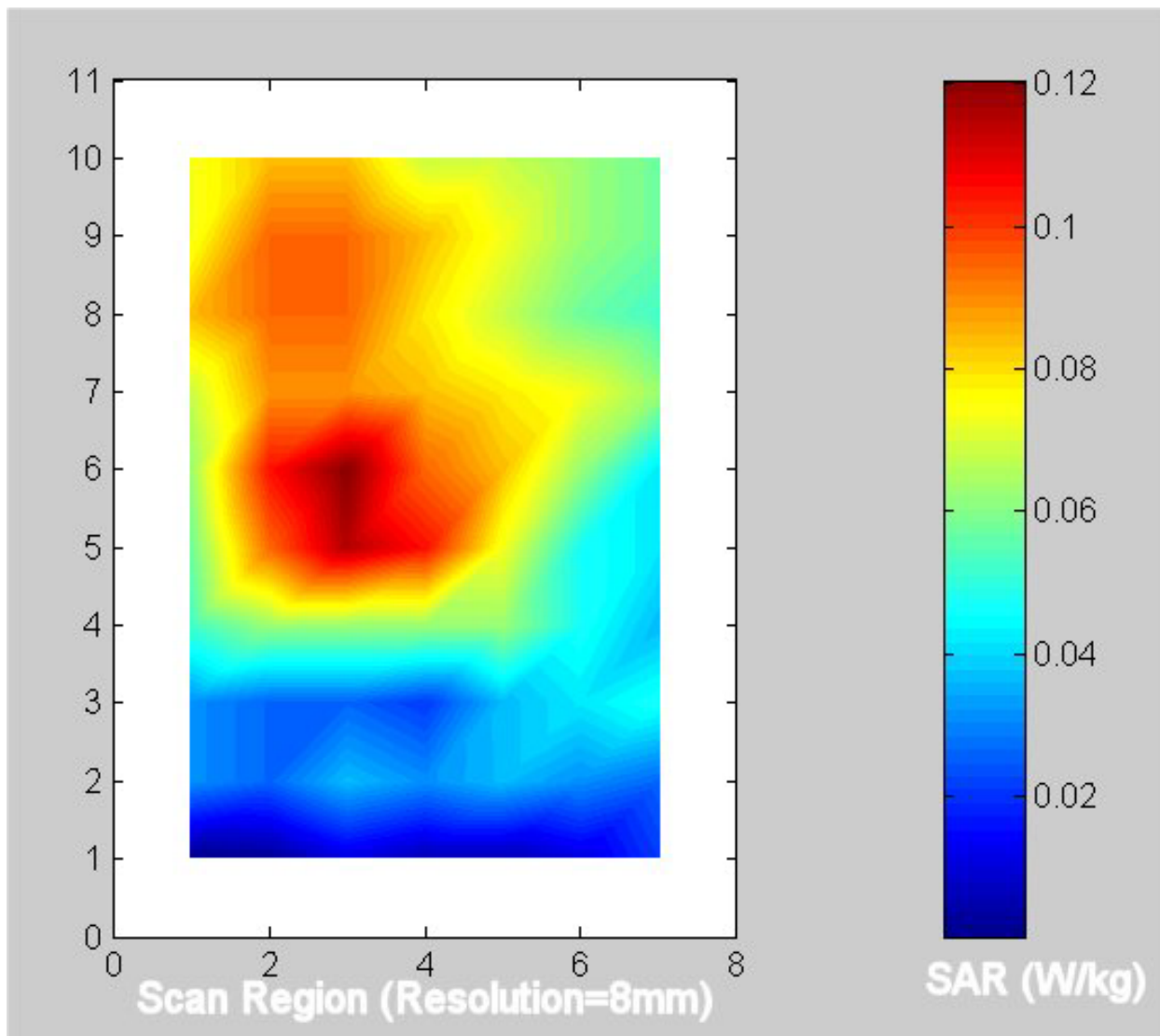
7. *Demonstrate that probe calibration with CW signal applies to modulated signals in filing.*

Response:

For the microvoltmeters in our SAR system (HP34401A Multimeters), we use an AC signal filter with a passband of 20 Hz to 300 kHz (1 reading/second). This allows faithful readings of the rectified values of voltage outputs from the three pickup antennas (proportional to E^2) of the E-field probe used for SAR measurements. For a variety of modulated signals often used for wireless PCs including the present Ambit Microsystems Mini PCI (FCC ID# J07H06901), the multimeter passband of 20 Hz to 300 kHz is more than sufficient to read all of the frequency components. We have tested the validity of using this AC signal filter by applying signals from a Hewlett Packard Model 83620A synthesized sweeper operating at 5.25 and 5.8 GHz in the CW mode as well as the pulse mode with pulse repetition rates for the latter variable from 50 to 500 Hz and pulse durations variable from 0.5 to 1 msec. For a fixed location of the E-field probe, the SAR readings are proportional to the time-averaged power into the waveguide (from 2.5 to 100 mW) with a probe calibration factor of 2.98 (mW/kg)/ $\mu\text{V} \pm 5\%$.

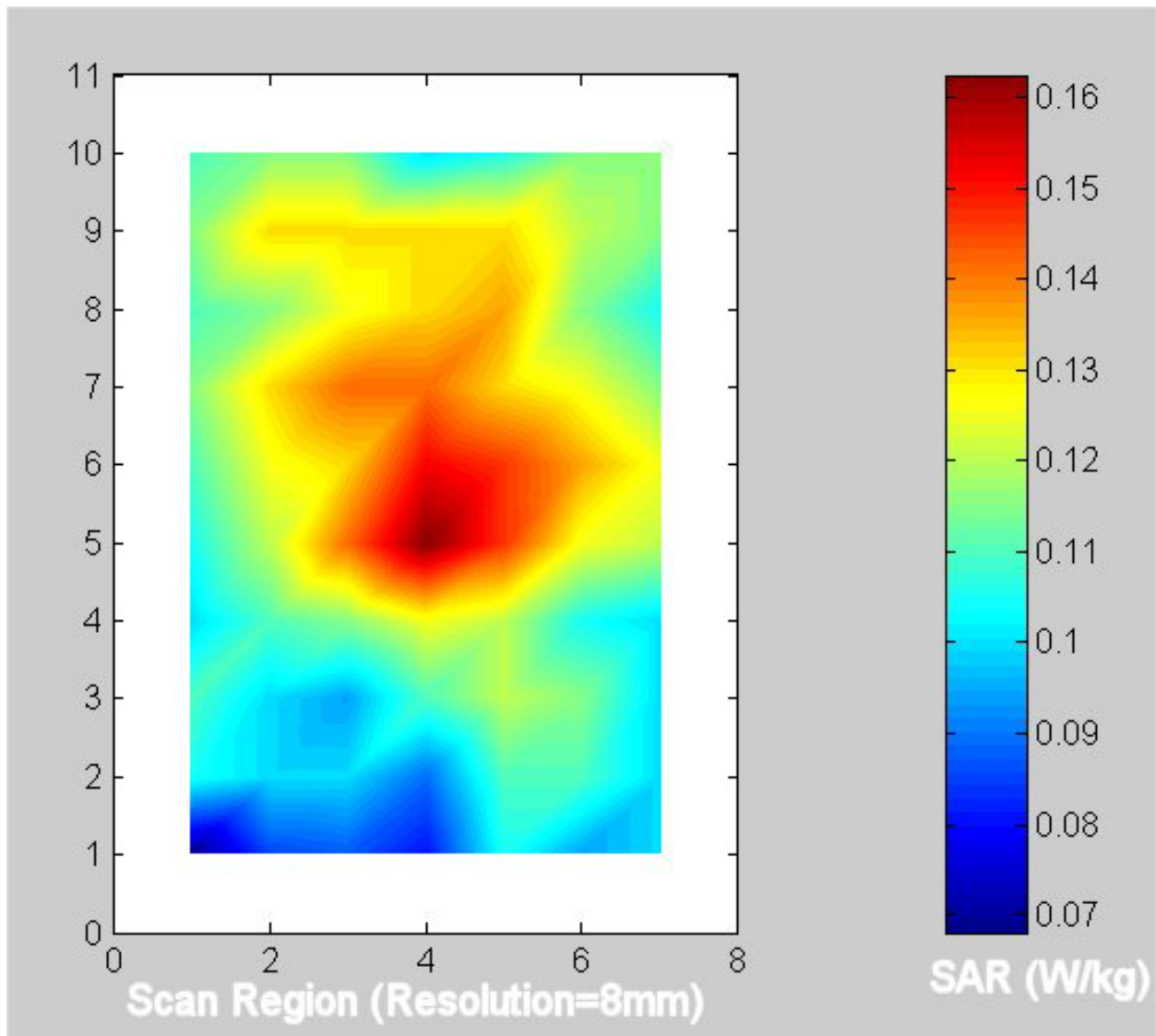


Fig. a. A photograph of the Agency Laptop Computer showing the placement of the Ambit Microsystems 802.11 a/b Wireless Antennas against the two sides of the lid with the computer screen. (This is a corrected version of the previously submitted Fig. 2 where a Bluetooth Antenna, not used for this PC, was shown by mistake).



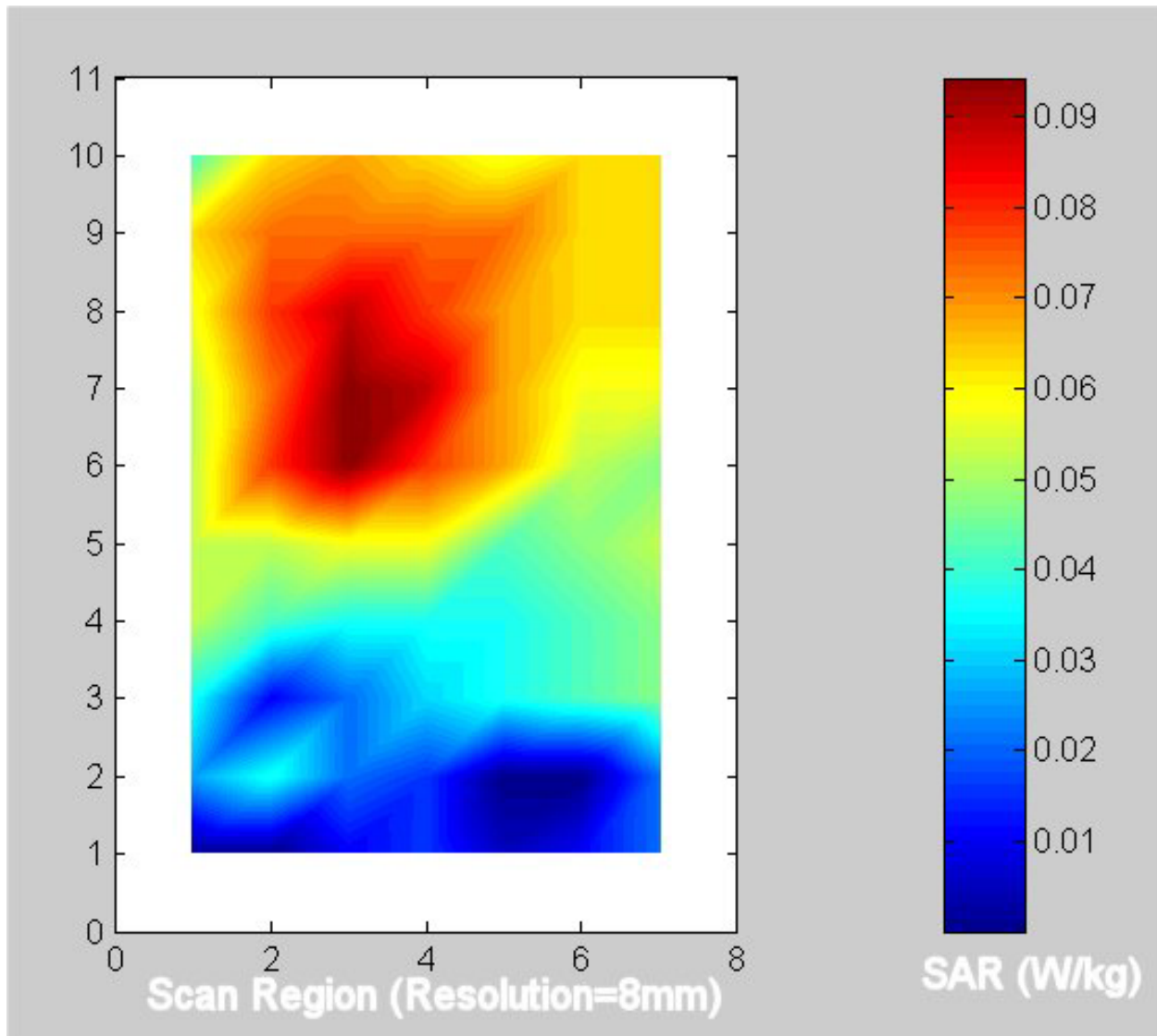
(1) 5.26 GHz base mode (see Table b for the peak 1-g SAR).]

Fig. b. Coarse scans for the SAR measurements for the **Edge-on** placement of the PC at 90° relative to the flat phantom (**Configuration 2**, see Fig. 6 of the SAR report). The edge of the PC screen with the 802.11a Antenna A was placed at a distance of 2.5 cm from the bottom of the flat phantom.



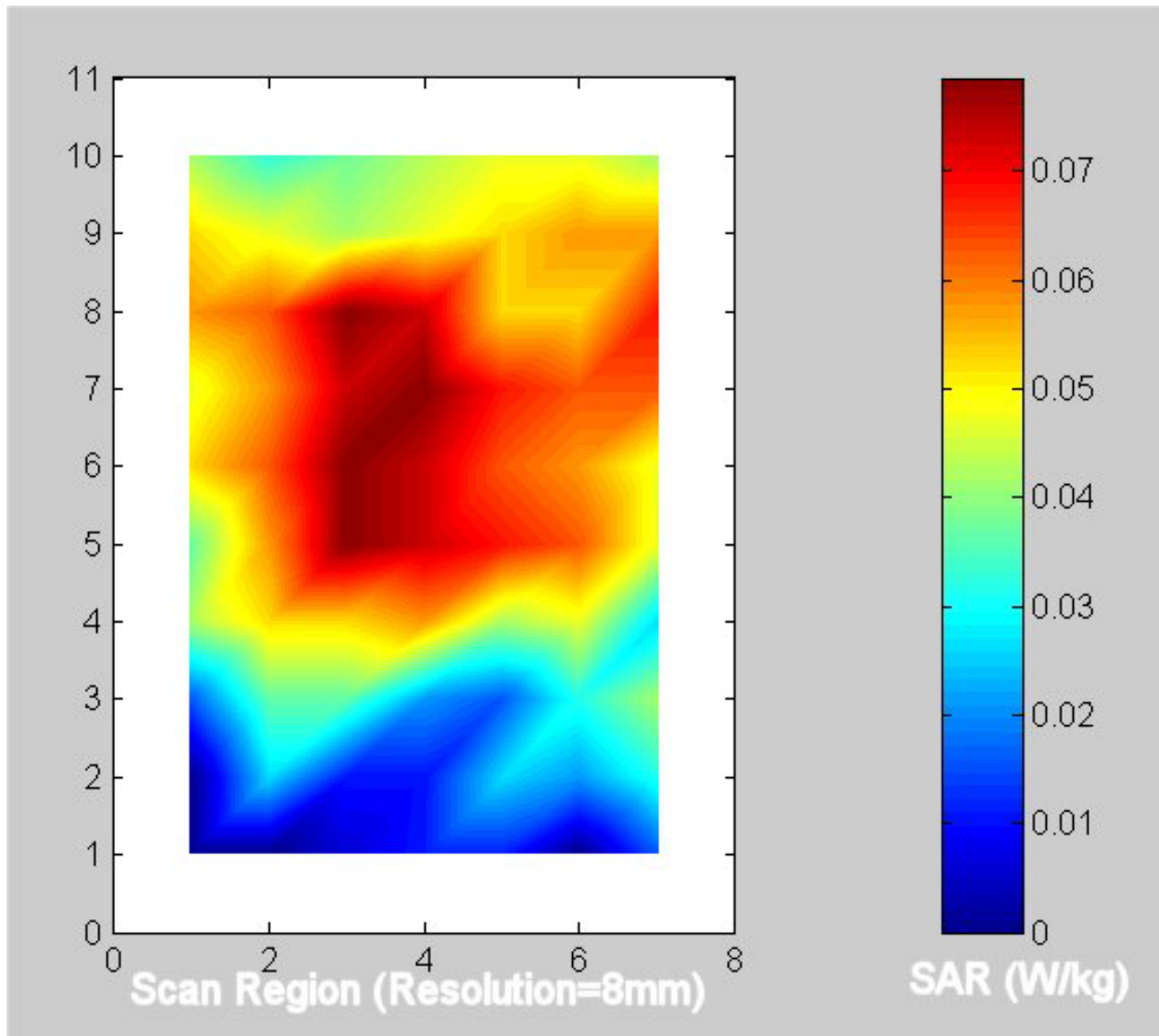
(2) 5.785 GHz base mode (see Table c for the peak 1-g SAR).]

Fig. b. Coarse scans for the SAR measurements for the **Edge-on** placement of the PC at 90° relative to the flat phantom (**Configuration 2**, see Fig. 6 of the SAR report). The edge of the PC screen with the 802.11a Antenna A was placed at a distance of 2.5 cm from the bottom of the flat phantom.



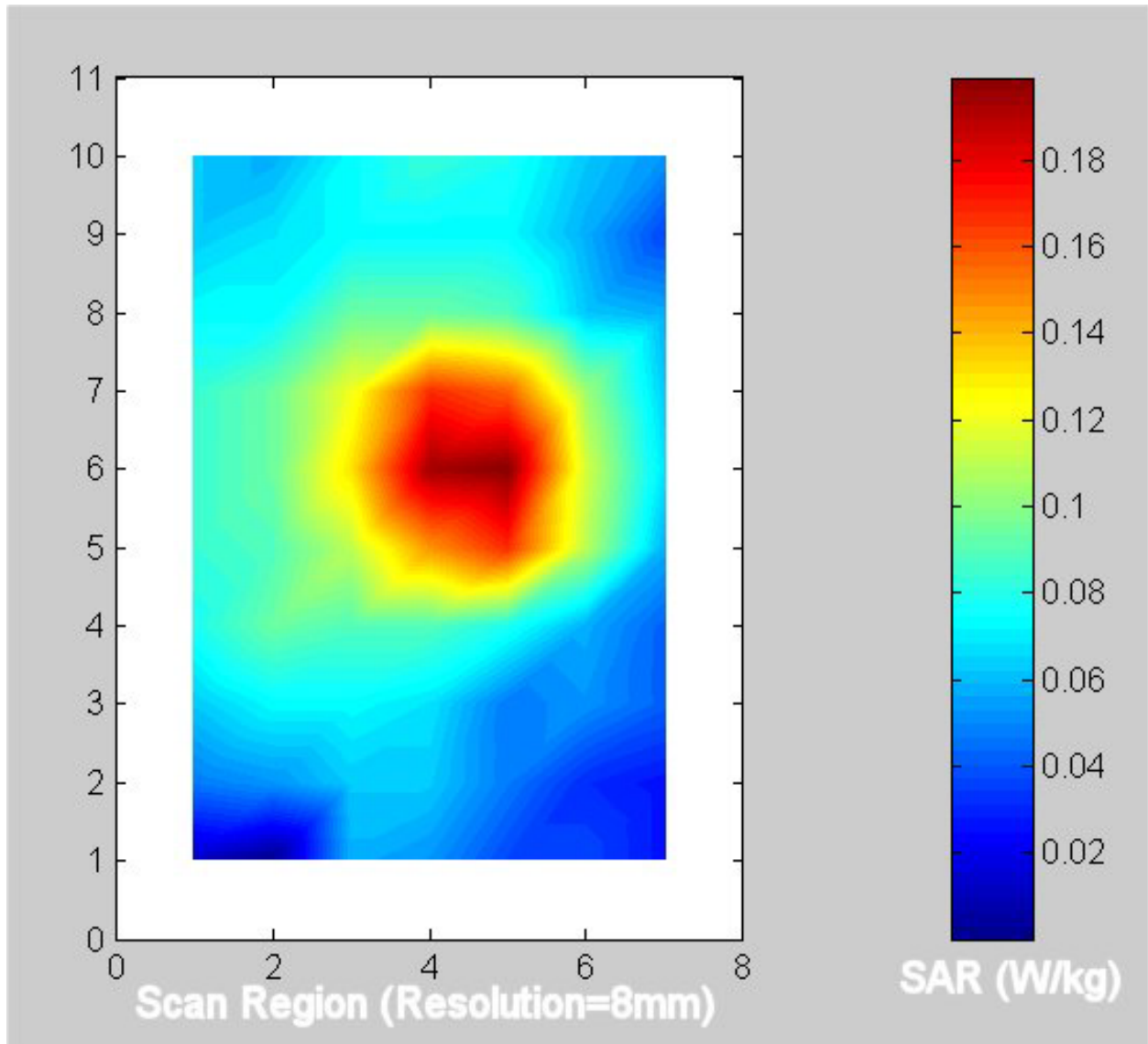
(3) 5.25 GHz turbo mode (see Table d for the peak 1-g SAR).]

Fig. b. Coarse scans for the SAR measurements for the **Edge-on** placement of the PC at 90° relative to the flat phantom (**Configuration 2**, see Fig. 6 of the SAR report). The edge of the PC screen with the 802.11a Antenna A was placed at a distance of 2.5 cm from the bottom of the flat phantom.



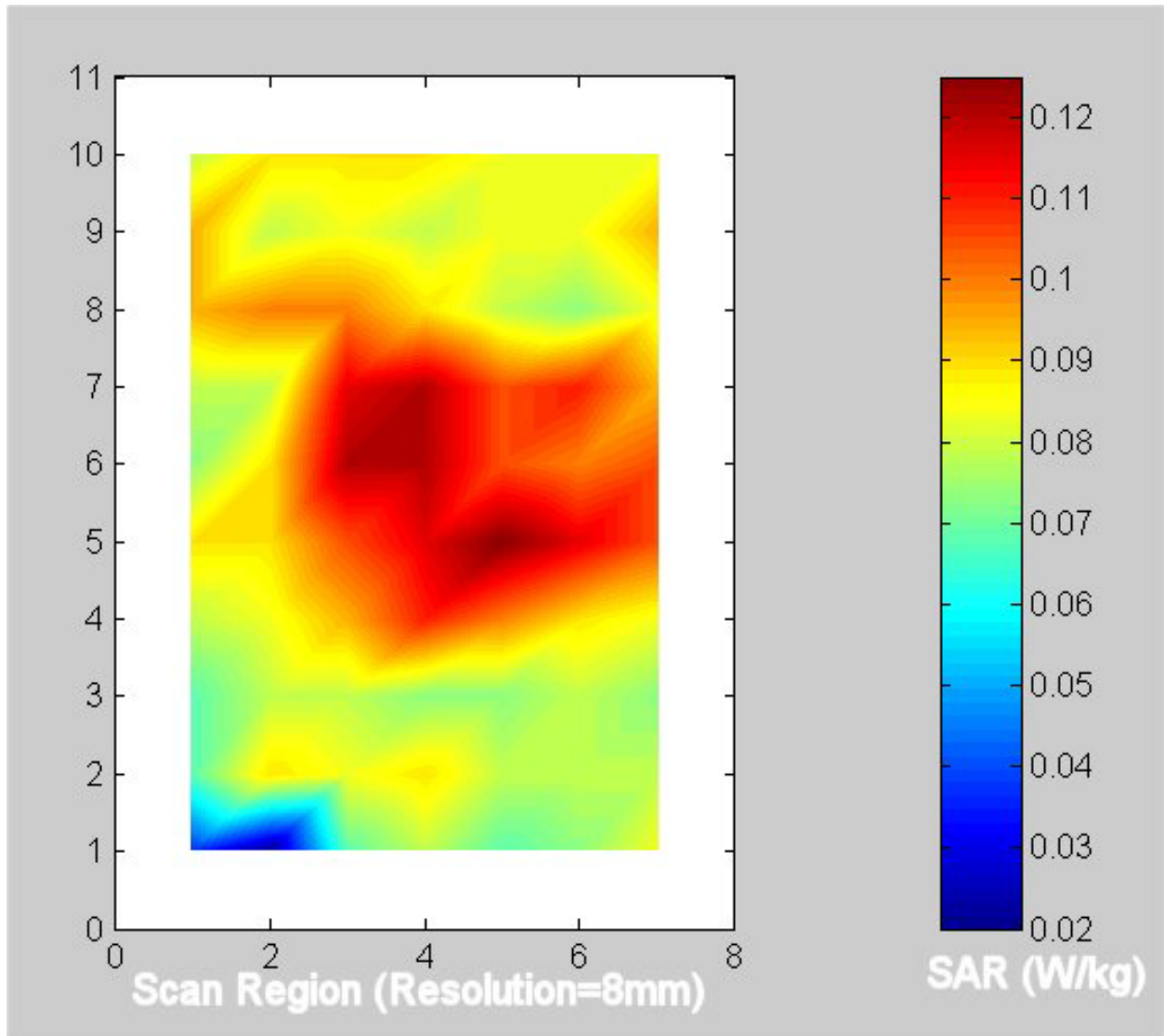
(4) 5.80 GHz turbo mode (see Table e for the peak 1-g SAR).]

Fig. b. Coarse scans for the SAR measurements for the **Edge-on** placement of the PC at 90° relative to the flat phantom (**Configuration 2**, see Fig. 6 of the SAR report). The edge of the PC screen with the 802.11a Antenna A was placed at a distance of 2.5 cm from the bottom of the flat phantom.



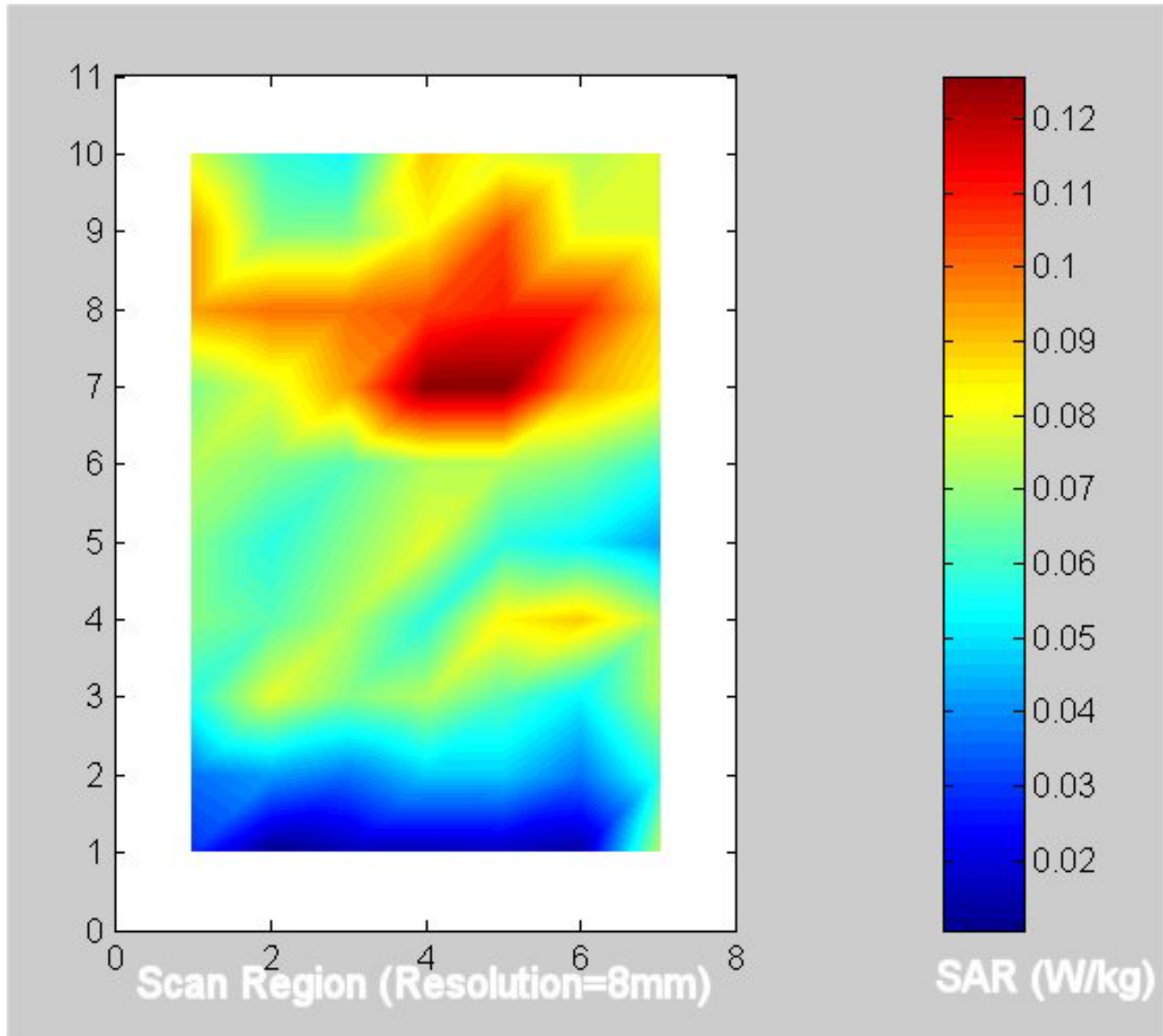
(1) 5.26 GHz base mode (see Table f for the peak 1-g SAR).]

Fig. c. Coarse scans for the SAR measurements for Antenna A for the **End-on position (Configuration 3)**. The cover of the PC (with display open) was placed parallel to the base of the planar phantom at a distance of 2.5 cm.



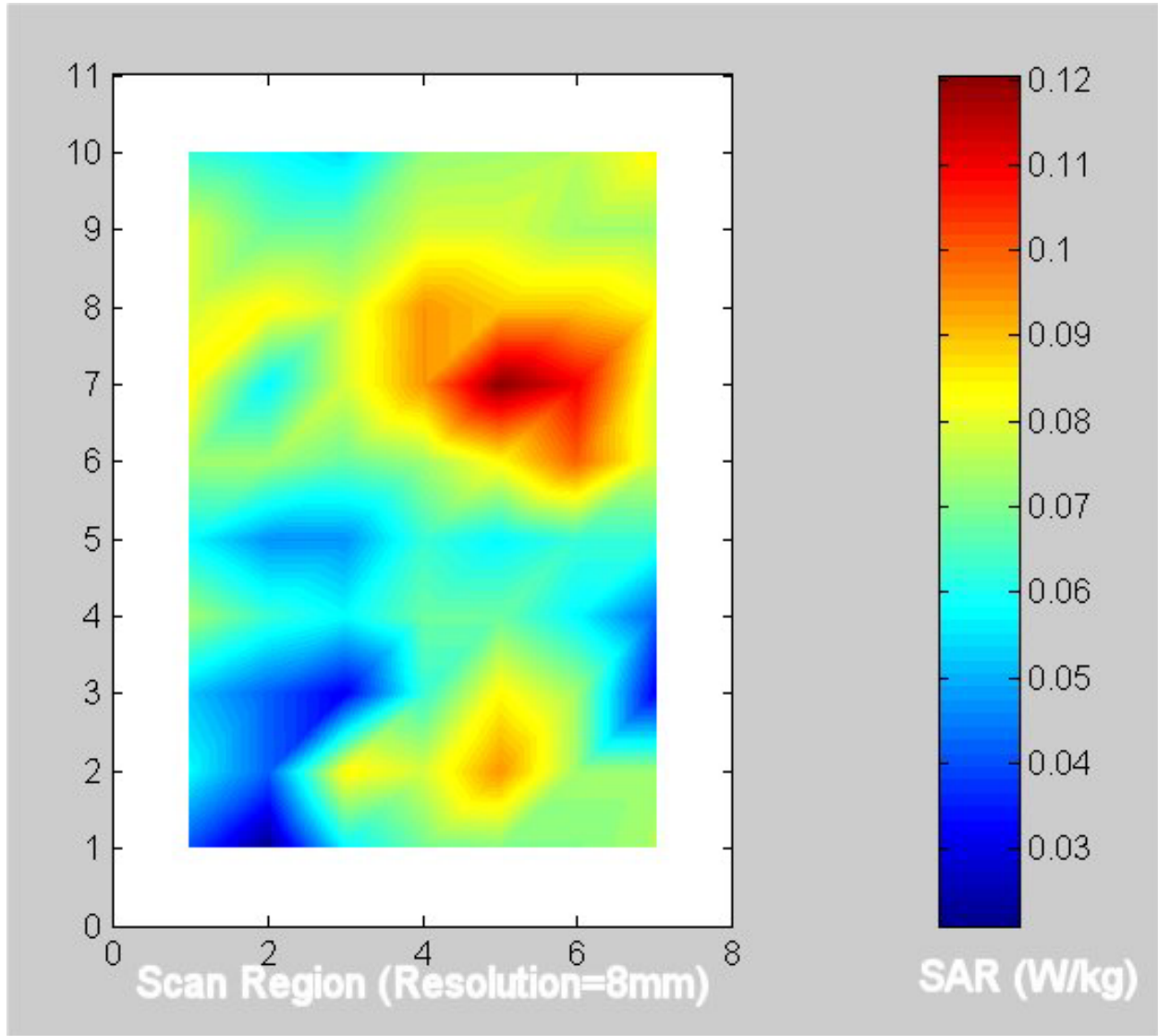
(2) 5.785 GHz base mode (see Table g for the peak 1-g SAR).]

Fig. c. Coarse scans for the SAR measurements for Antenna A for the **End-on position (Configuration 3)**. The cover of the PC (with display open) was placed parallel to the base of the planar phantom at a distance of 2.5 cm.



(3) 5.25 GHz turbo mode (see Table h for the peak 1-g SAR).]

Fig. c. Coarse scans for the SAR measurements for Antenna A for the **End-on position (Configuration 3)**. The cover of the PC (with display open) was placed parallel to the base of the planar phantom at a distance of 2.5 cm.



(4) 5.80 GHz turbo mode (see Table i for the peak 1-g SAR).]

Fig. c. Coarse scans for the SAR measurements for Antenna A for the **End-on position (Configuration 3)**. The cover of the PC (with display open) was placed parallel to the base of the planar phantom at a distance of 2.5 cm.

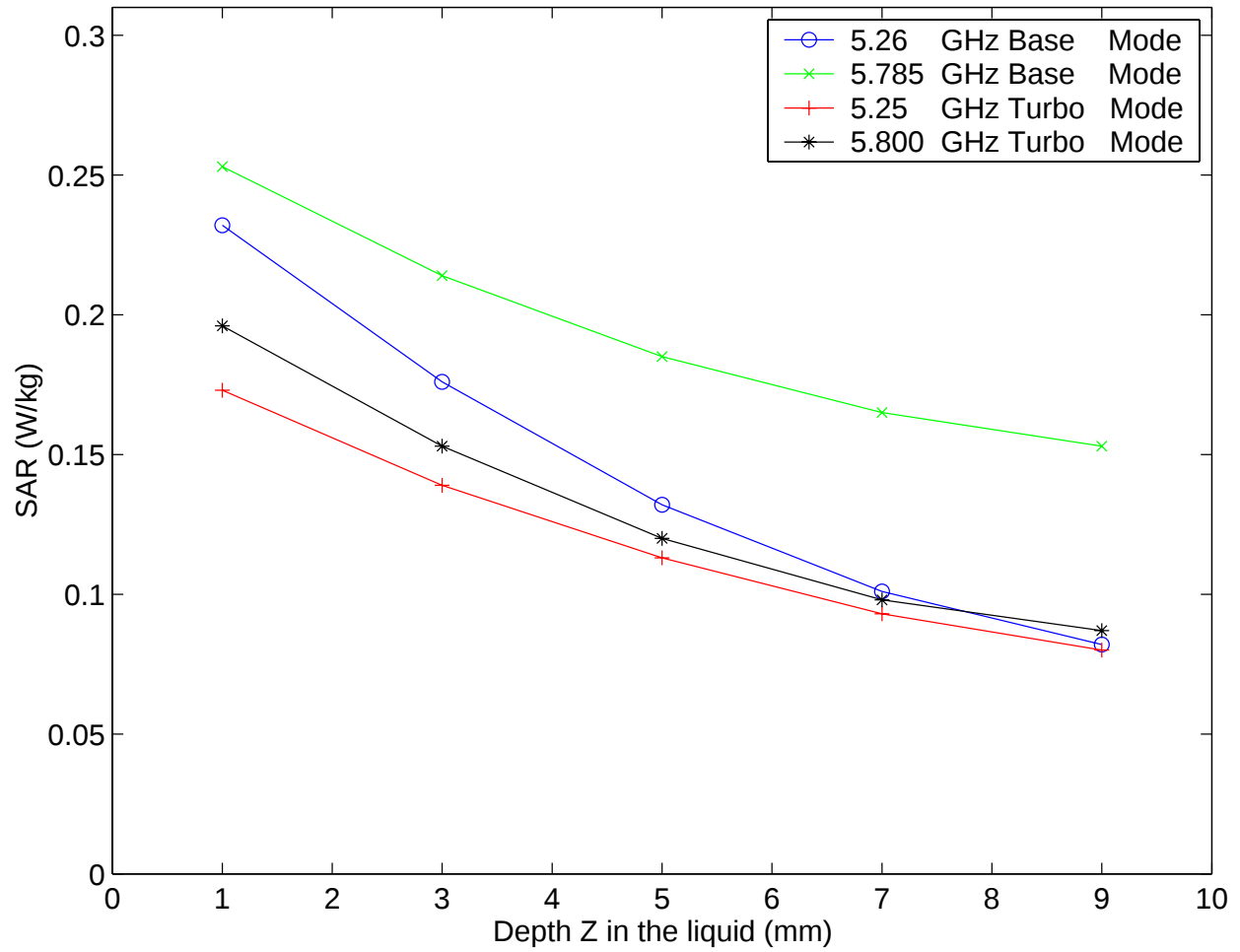


Fig. d. Plot of the SAR variations as a function of depth Z in the liquid for locations of the highest SAR (from Tables b-e) for **Configuration 2 – Edge-on position** of Antenna A relative to the flat phantom.

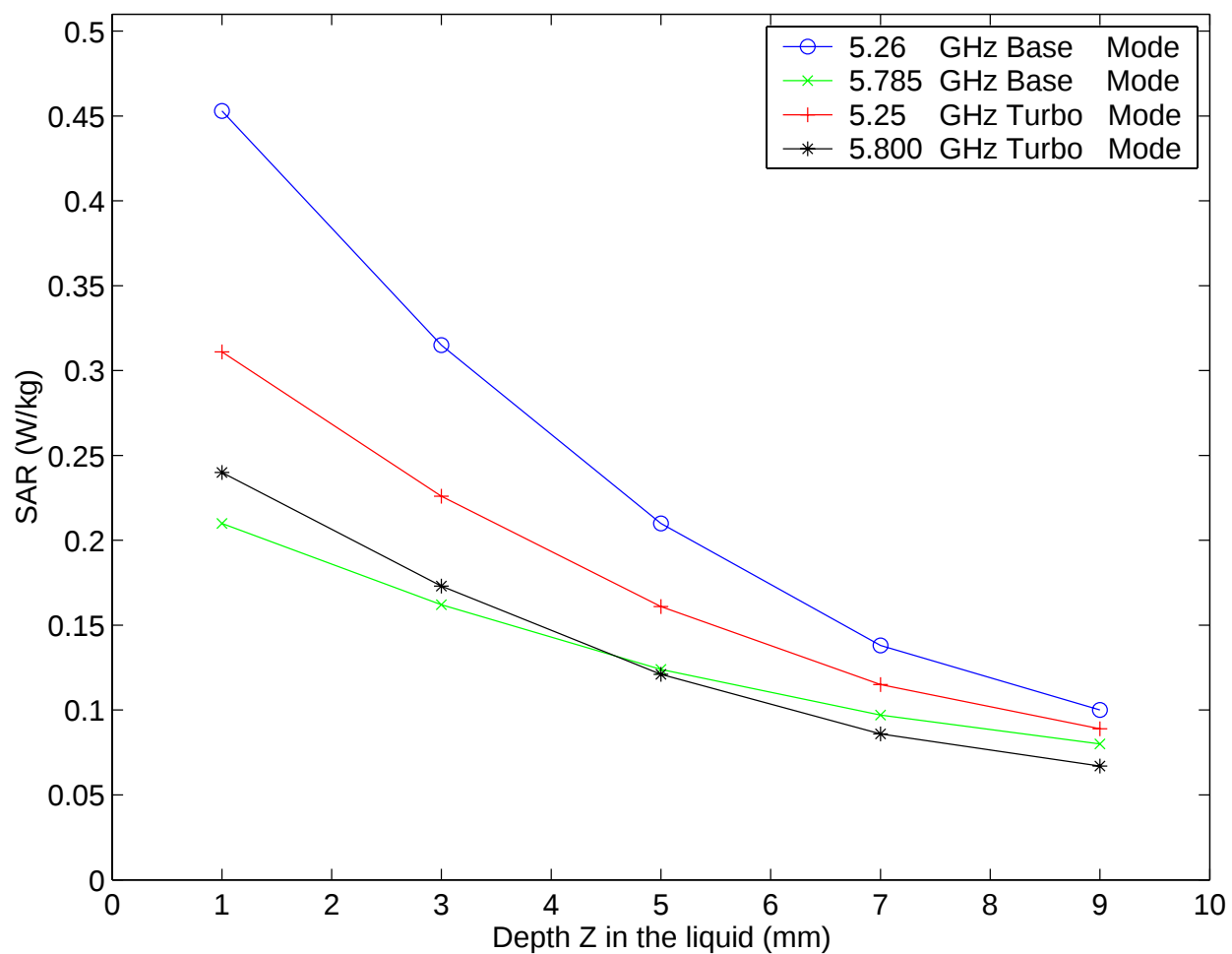


Fig. e. Plot of the SAR variations as a function of depth Z in the liquid for locations of the highest SAR (from Tables f-i) for **Configuration 3 – End-on position** of Antenna A relative to the flat phantom.



Fig. f. Photograph of the top cover to the Agency Series Laptop Computer with built-in Ambit Microsystems 802.11 a/b Wireless Antennas A and B. Marked here as the various regions 1-12 close to and including the higher SAR Antenna B, each of dimension 5.6×8.0 cm that have been scanned for SAR distributions with a coarse scan resolution of 0.8 cm (8 mm).

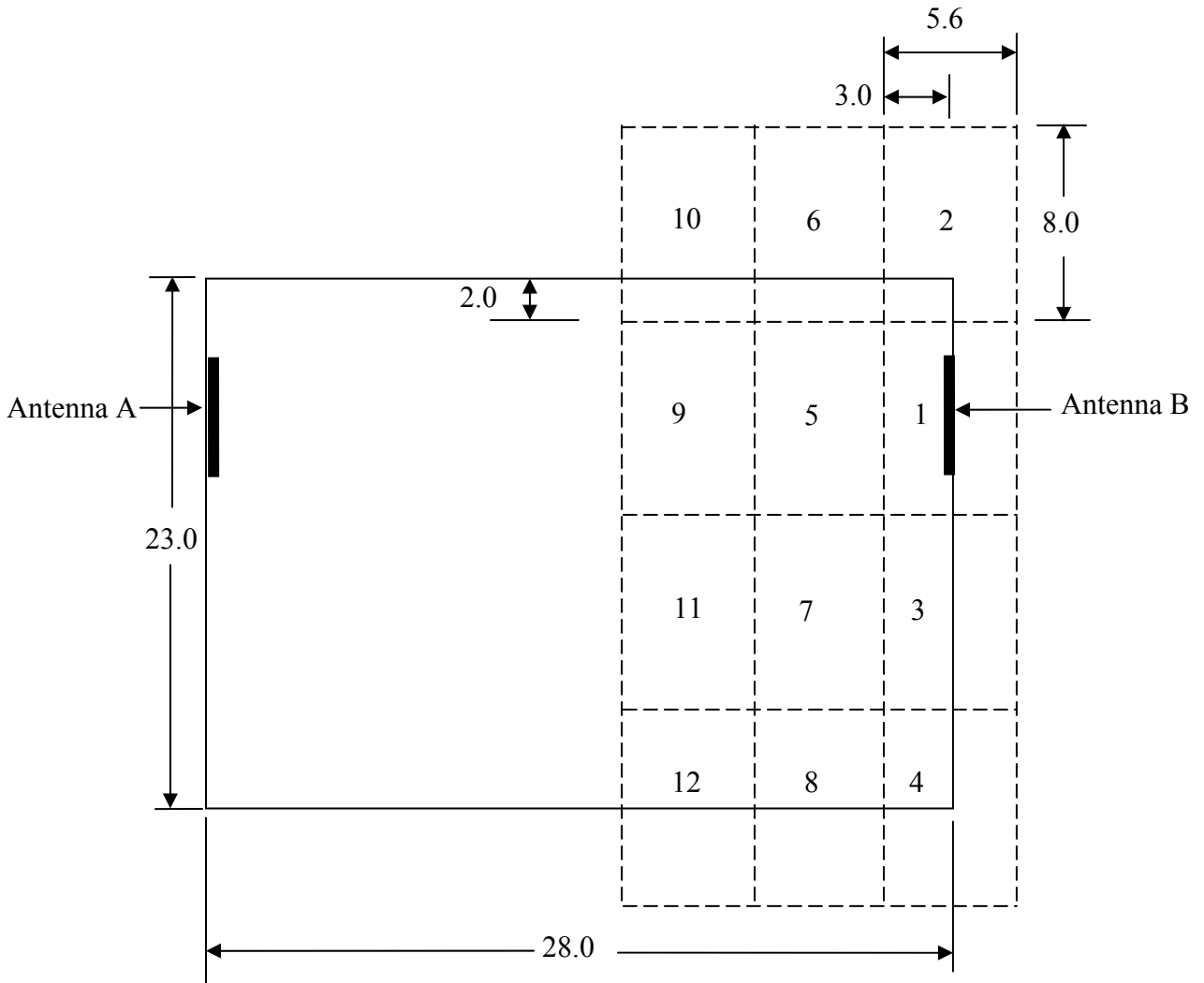


Fig. g. A sketch of the top cover of Agency Series Laptop Computer indicating the locations of the individual scan regions 1-12. All dimensions are in cm.

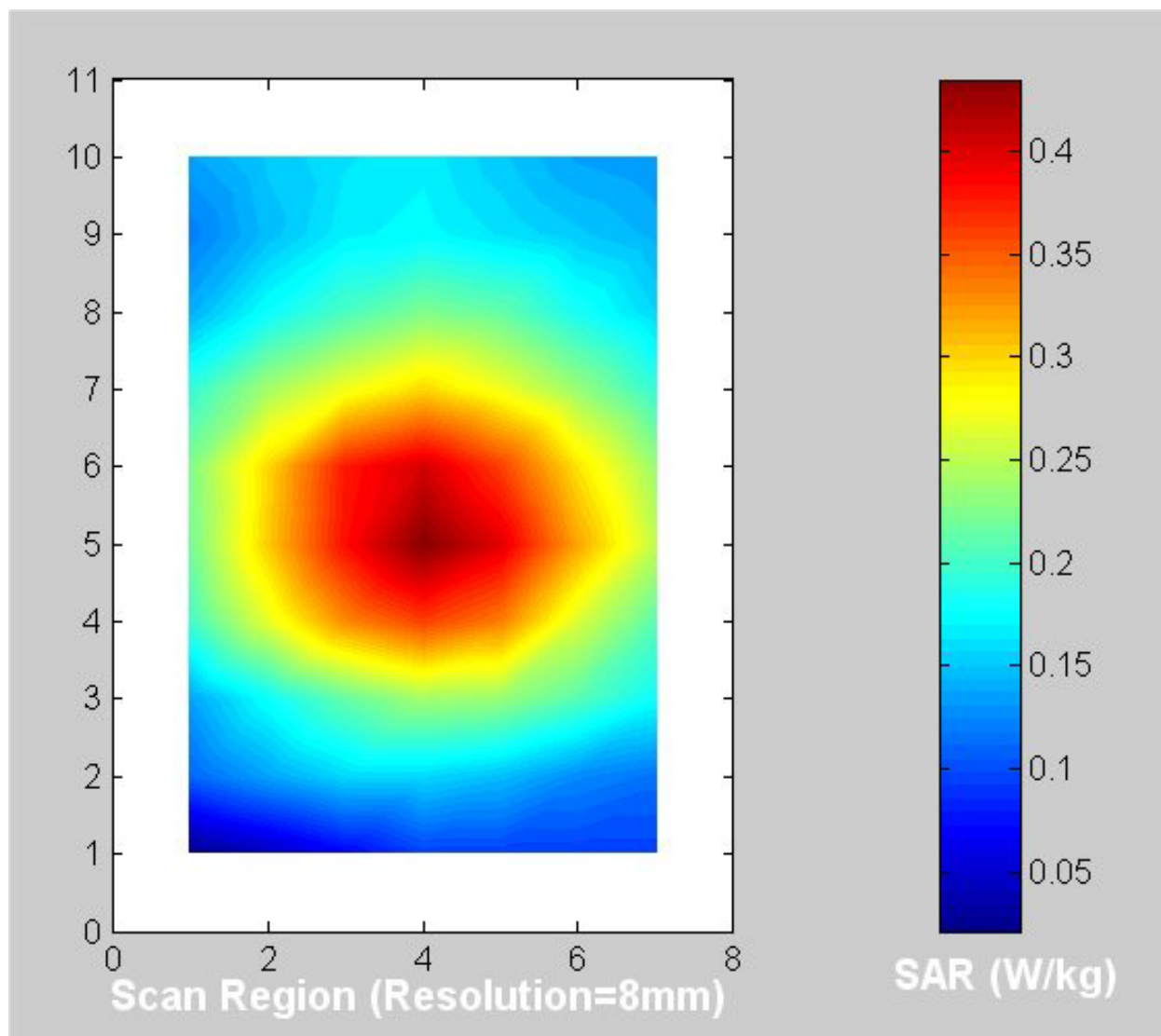


Fig. h. The measured SAR distribution for region 1 marked in Figs. f, g.

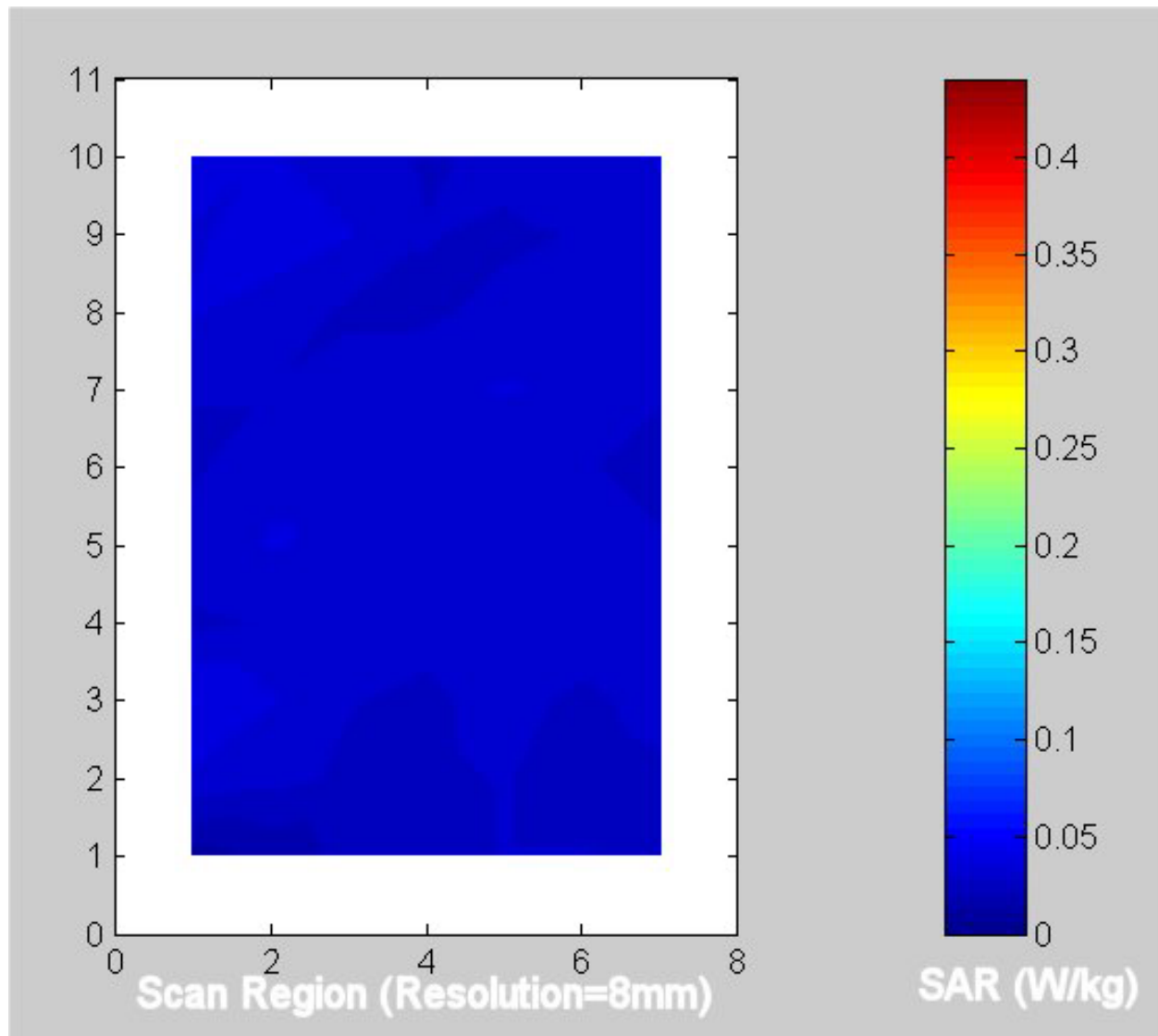


Fig. i. The measured SAR distribution for region 2 marked in Figs. f, g.

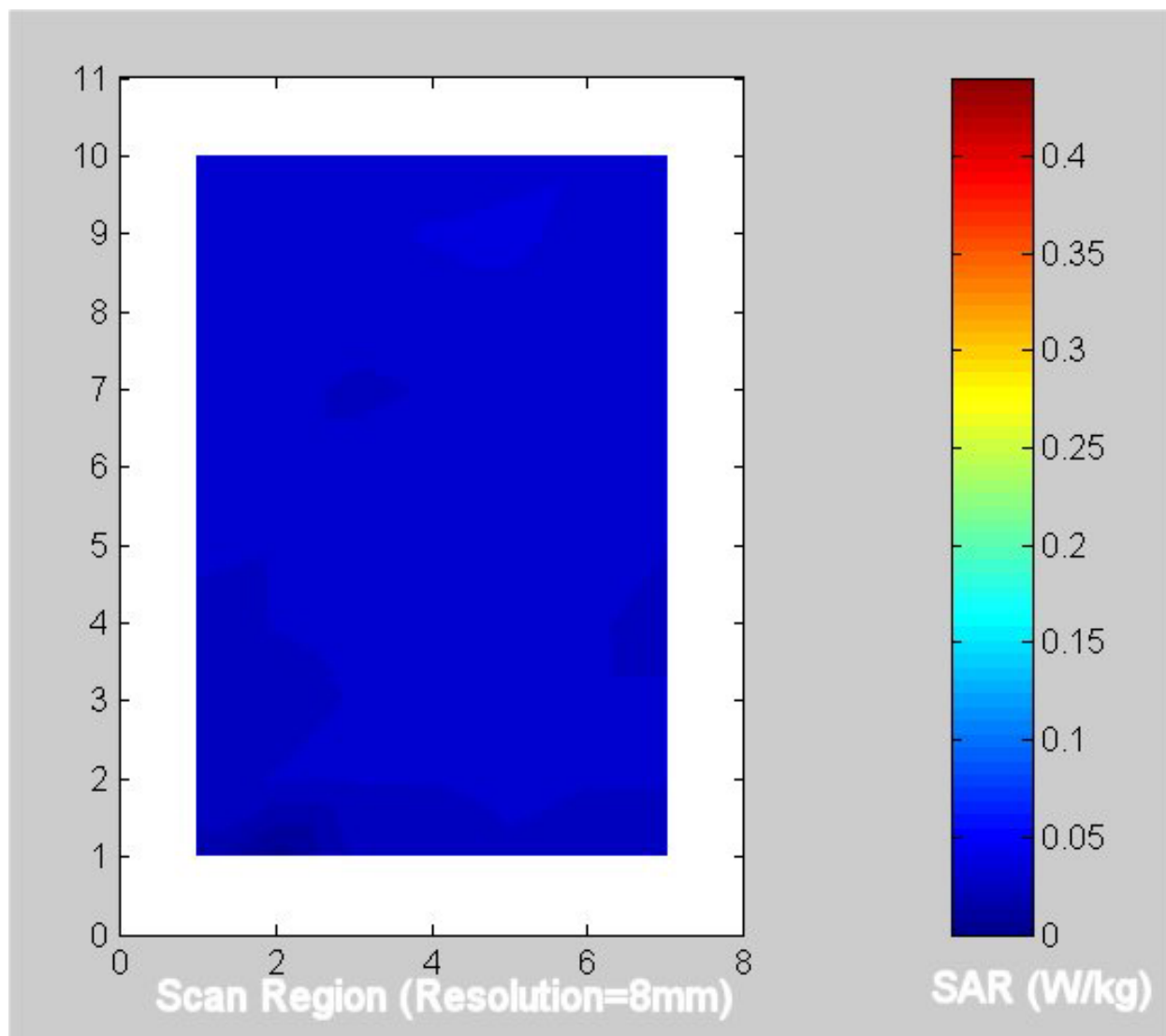


Fig. j. The measured SAR distribution for region 3 marked in Figs. f, g.

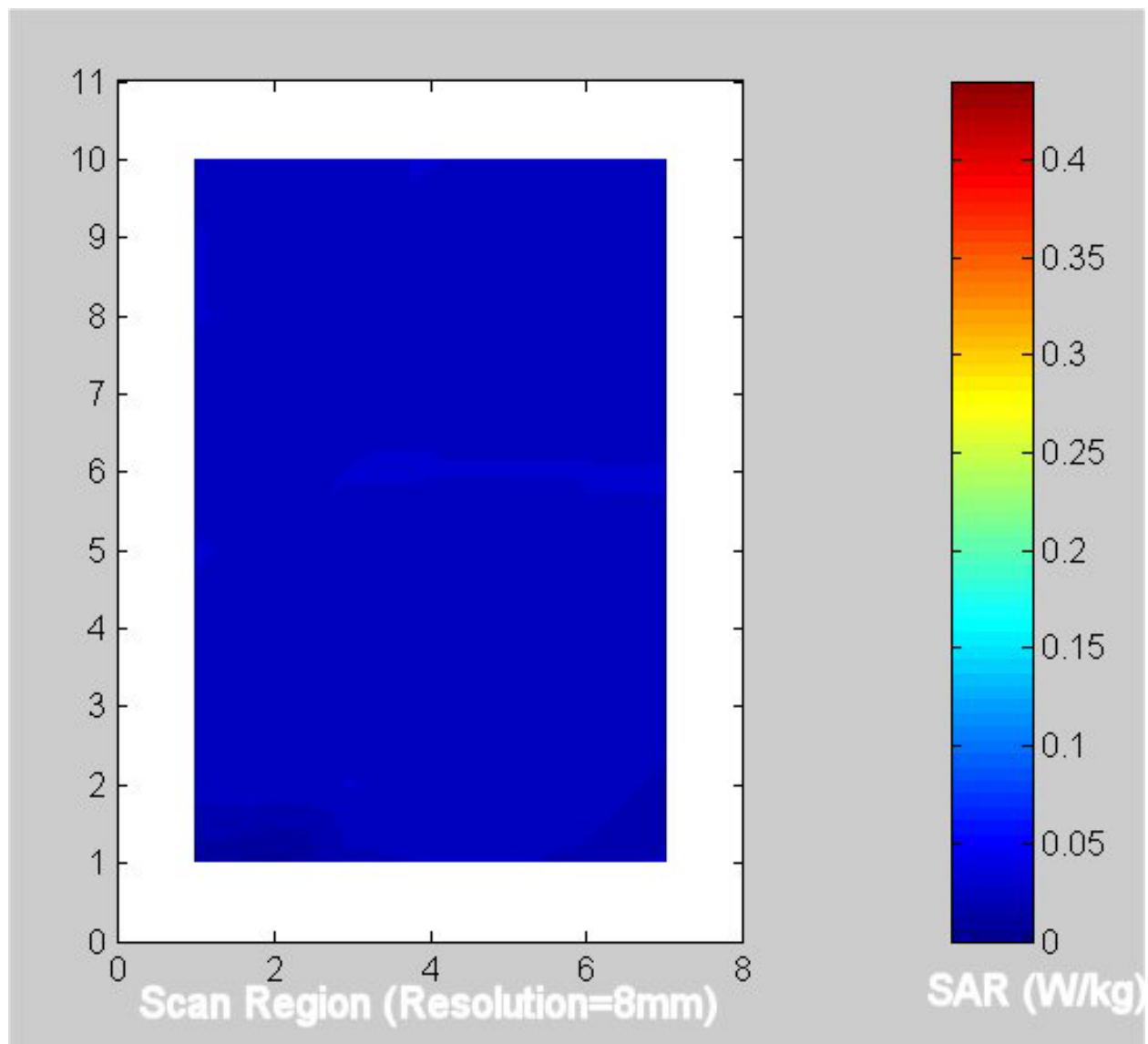


Fig. k. The measured SAR distribution for region 4 marked in Figs. f, g.

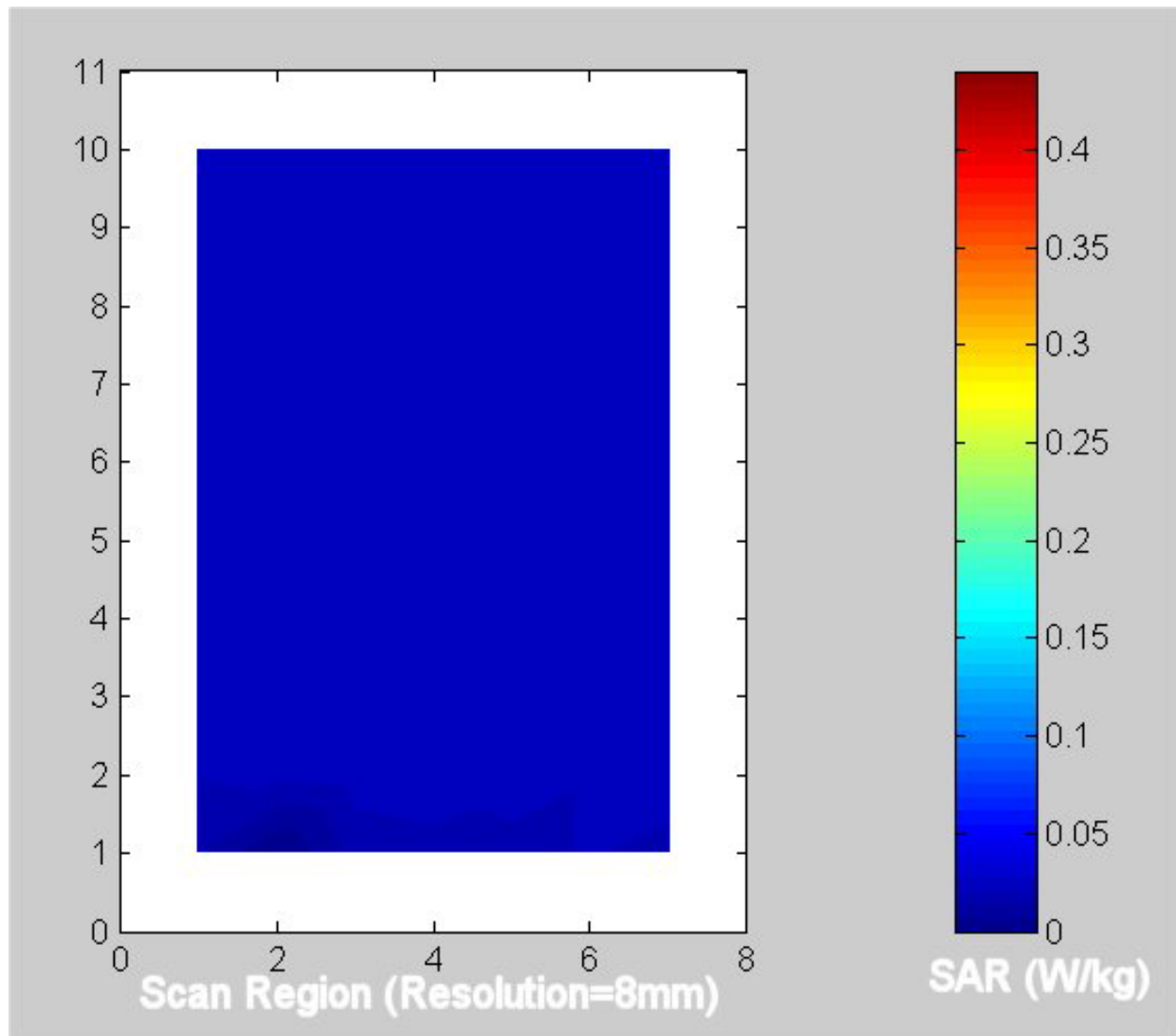


Fig. 1. The measured SAR distribution for region 5 marked in Figs. f, g.

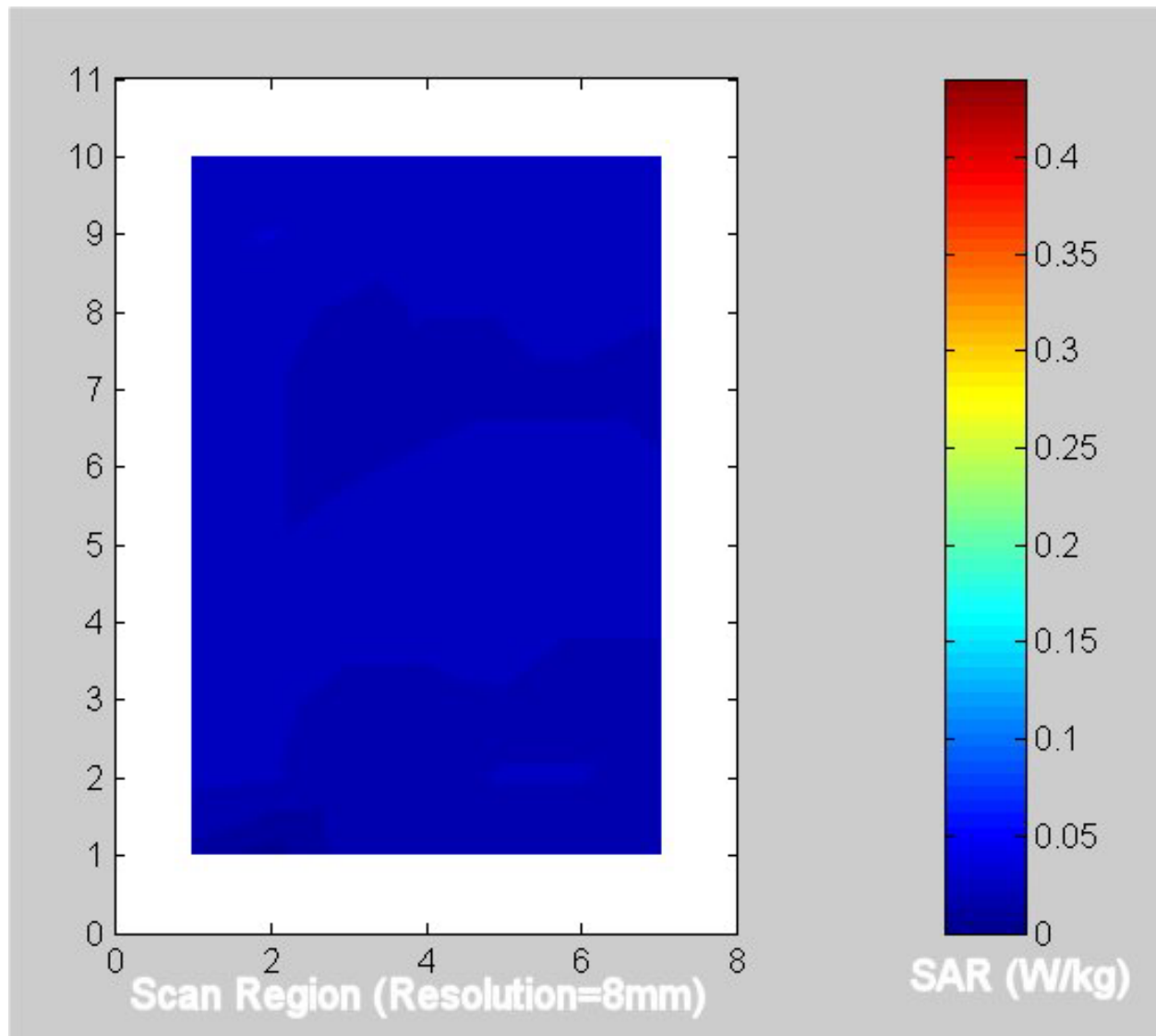


Fig. m. The measured SAR distribution for region 6 marked in Figs. f, g.

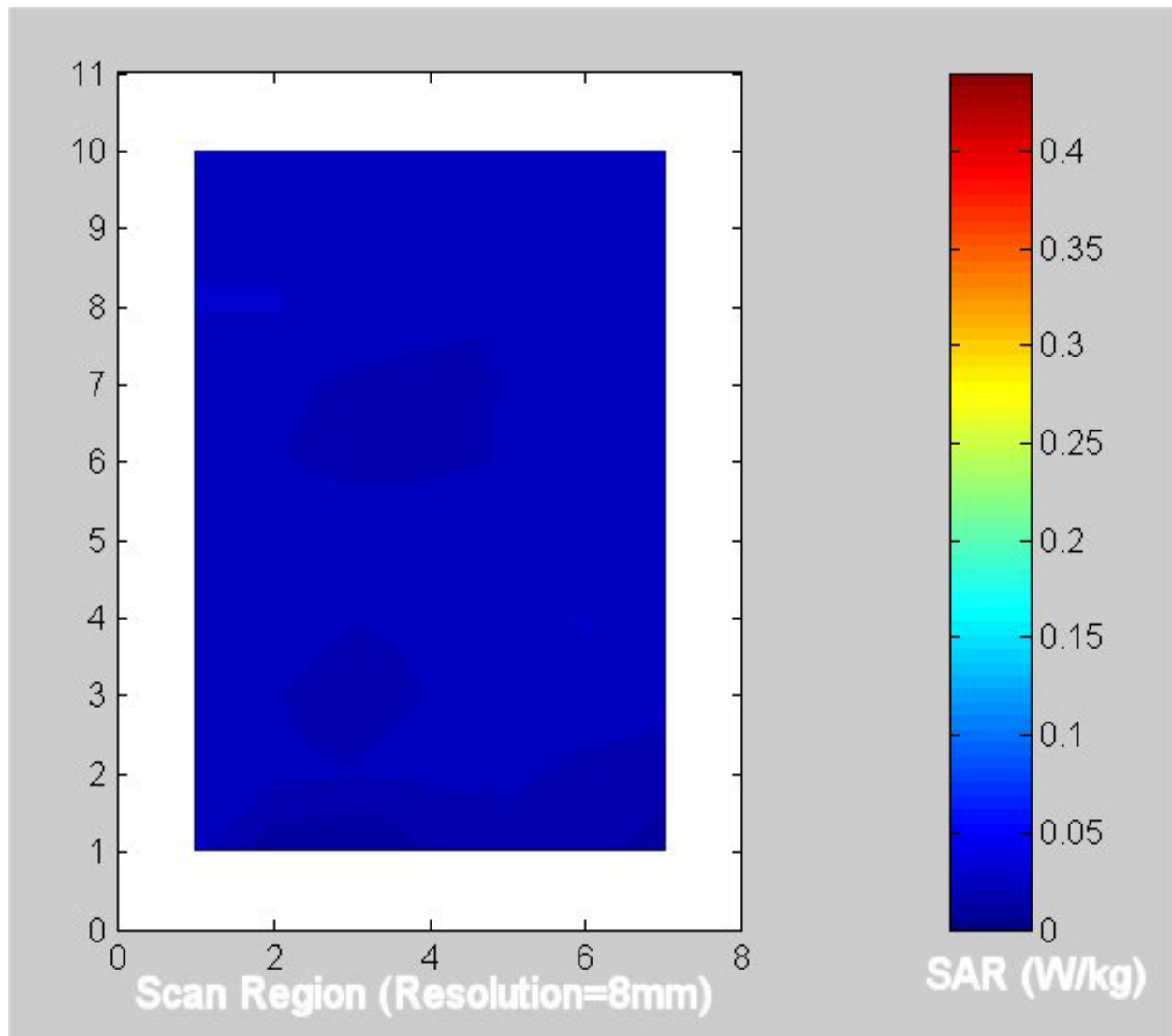


Fig. n. The measured SAR distribution for region 7 marked in Figs. f, g.

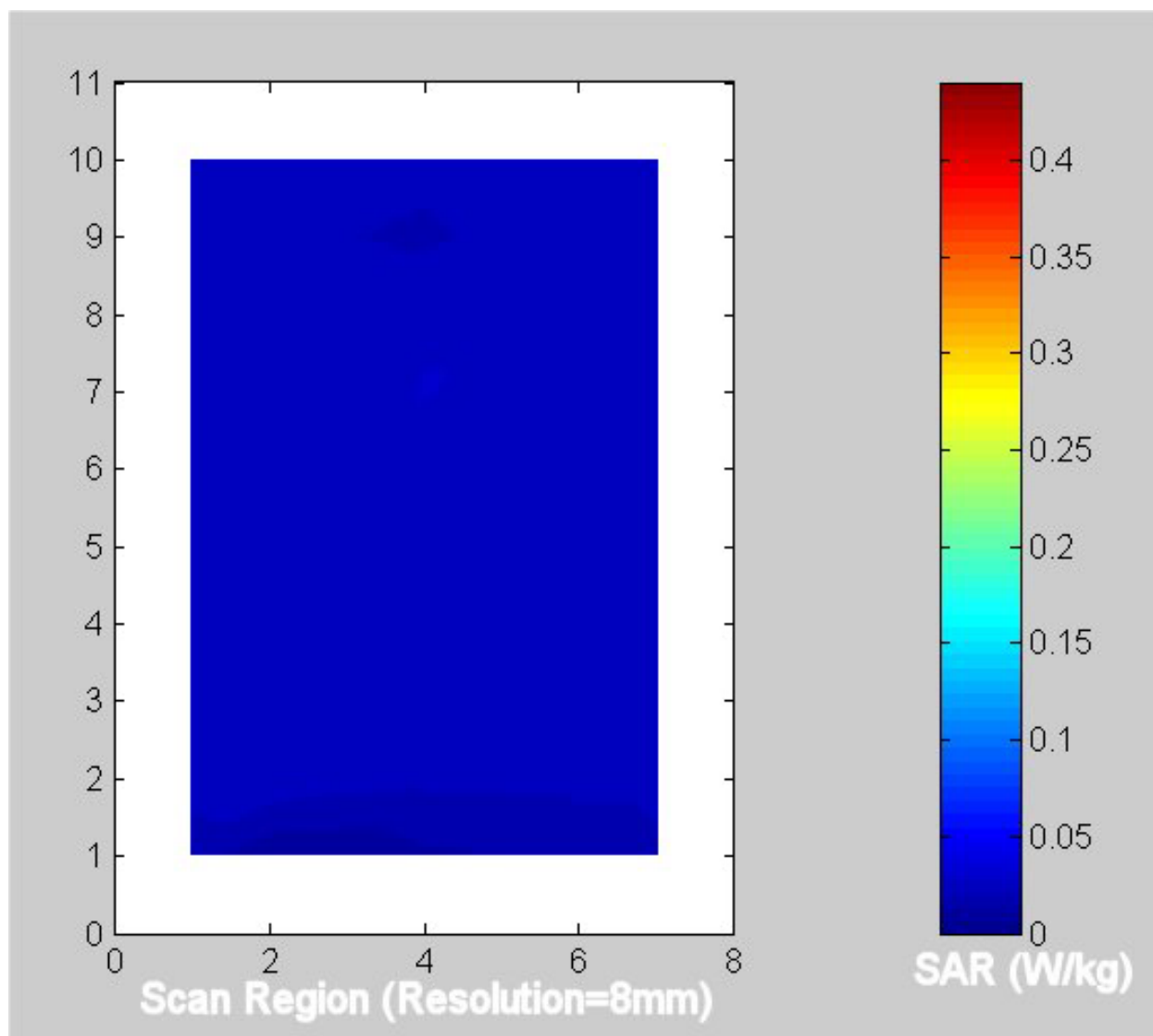


Fig. o. The measured SAR distribution for region 8 marked in Figs. f, g.

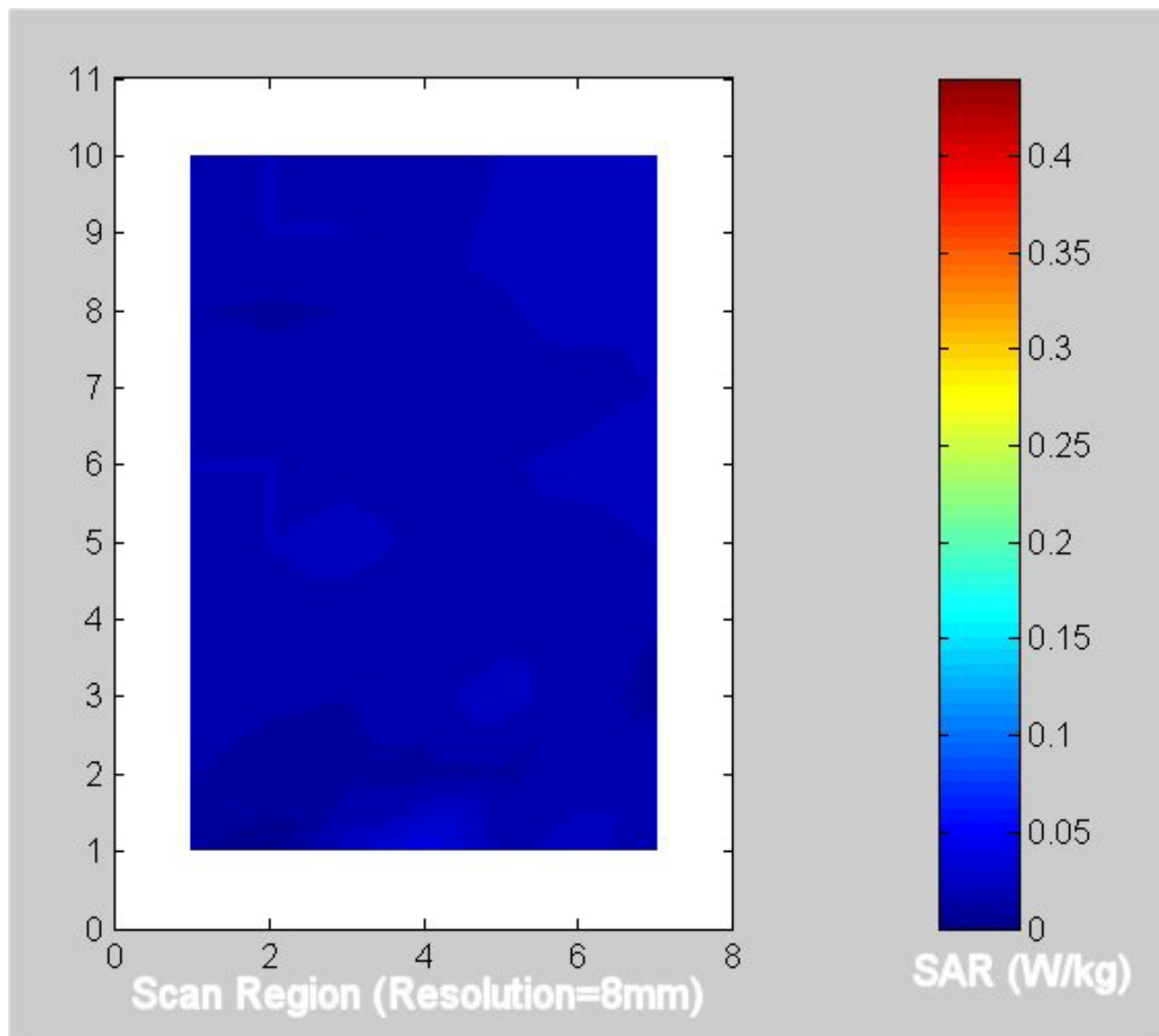


Fig. p. The measured SAR distribution for region 9 marked in Figs. f, g.

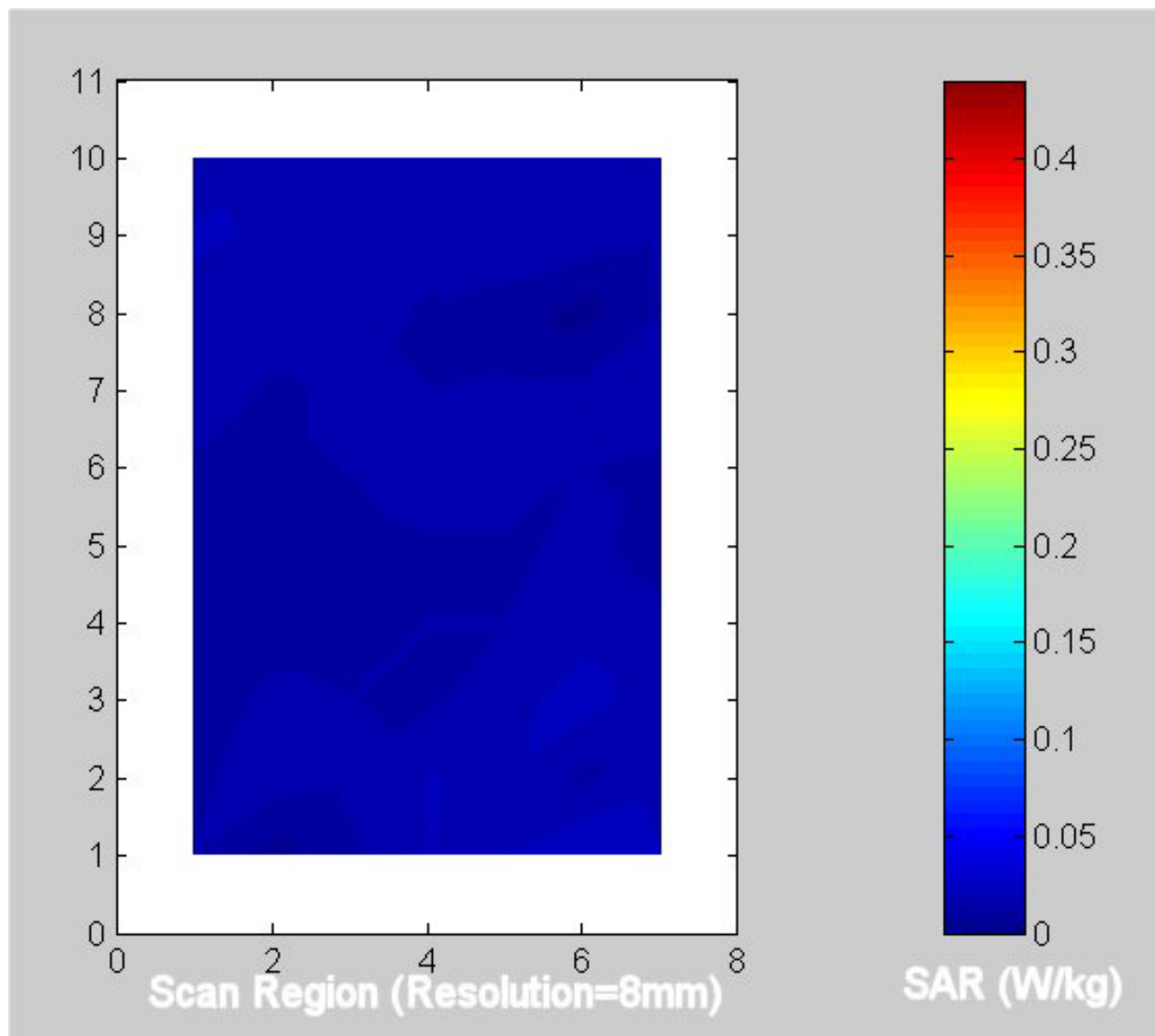


Fig. q. The measured SAR distribution for region 10 marked in Figs. f, g.

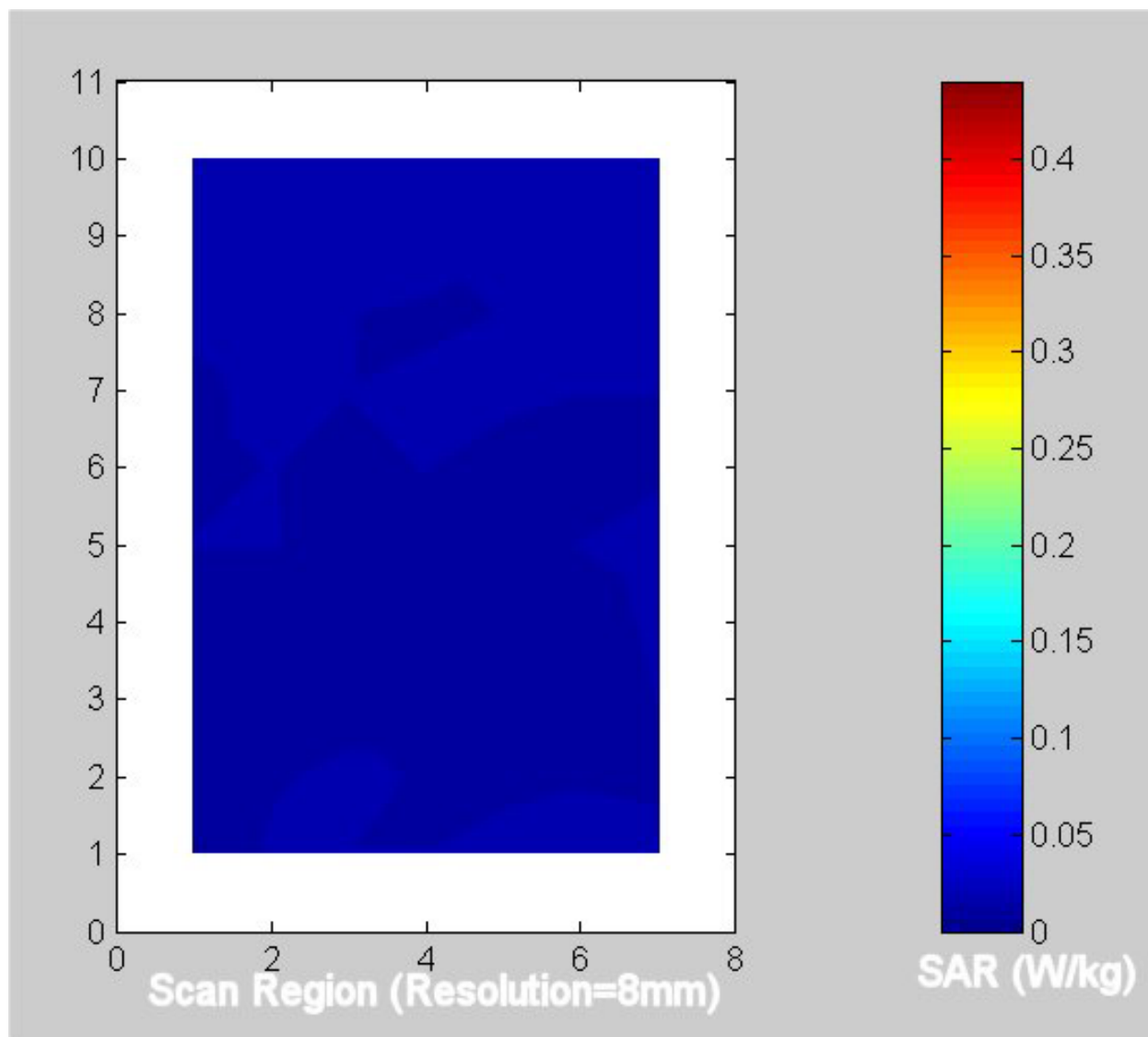


Fig. r. The measured SAR distribution for region 11 marked in Figs. f, g.

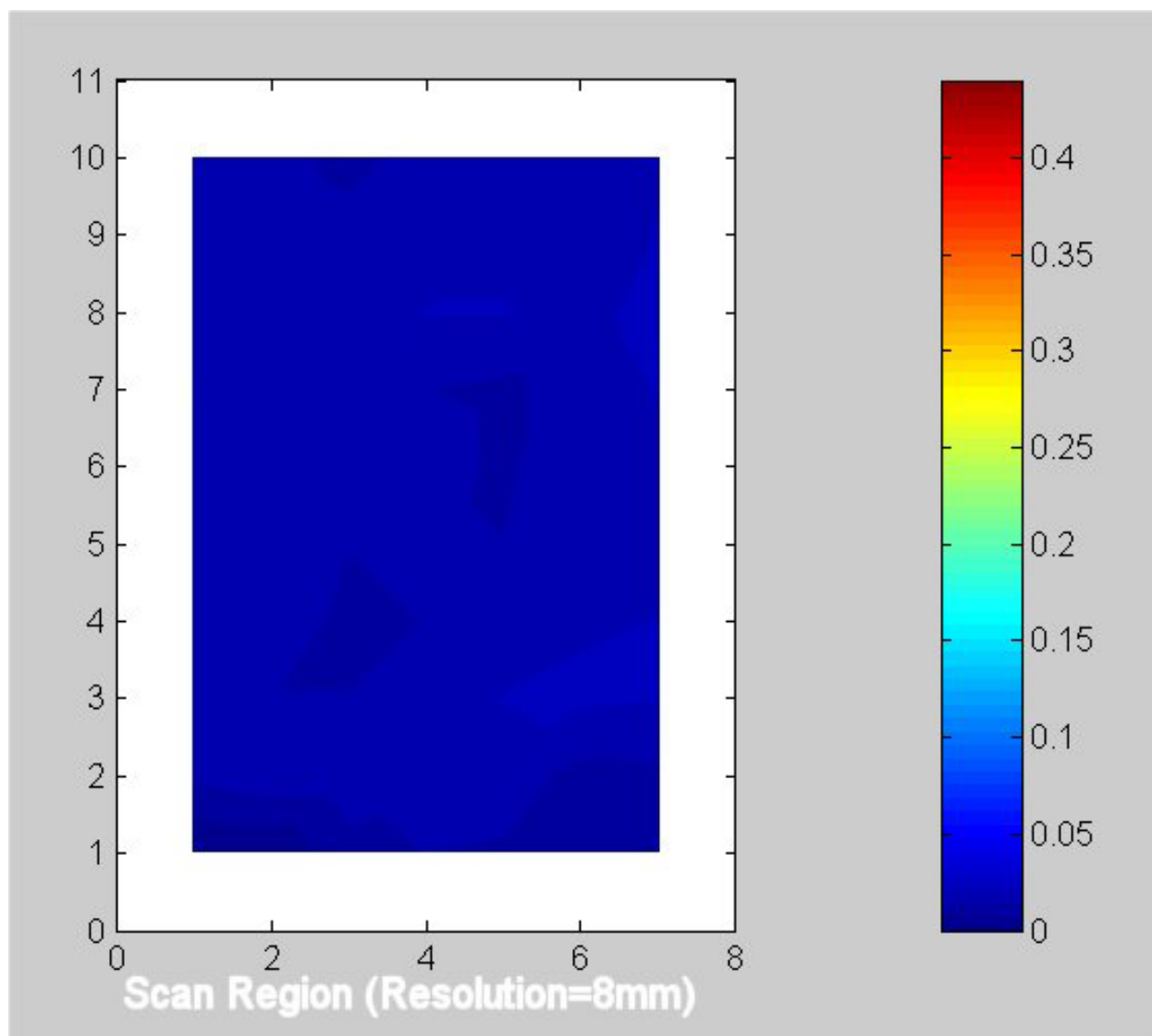


Fig. s. The measured SAR distribution for region 12 marked in Figs. f, g.

Table a. The peak 1-g SARs measured for the Ambit Microsystems 802.11a Wireless Antennas built into Agency Series PP2170 Laptop Computer (FCC ID# MCLJ07H06901).

1-g SAR in W/kg						
PC position relative to the flat phantom	Spacing to the bottom of the phantom	Antenna	5.26 GHz base mode	5.785 GHz base mode	5.25 GHz turbo mode	5.80 GHz turbo mode
Configuration 1 – "Above-lap" bottom of PC pressed against bottom of the flat phantom	0 cm	A	< 0.02*	< 0.02*	< 0.02*	< 0.02*
		B	< 0.02*	< 0.02*	< 0.02*	< 0.02*
Configuration 2 – "Edge-on" placement; edge of the PC at 90° and at a distance of 2.5 cm from the base of the phantom (see Fig. 6 of the SAR report)	2.5 cm	A	0.130	0.180	0.103	0.110
		B	0.172	0.257	0.229	0.177
Configuration 3 – "End-on" placement; top cover parallel and at a distance of 2.5 cm from the base of the phantom (see Fig. 7 of the SAR report)	2.5 cm	A	0.227	0.113	0.148	0.110
		B	0.416	0.334	0.293	0.325

* Too low to measure, within the noise limit of the SAR measurement system.

Table b. **Edge-on position (Configuration 2).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the base mode at 5.26 GHz.

$$1\text{-g SAR} = 0.130 \text{ W/kg}$$

a. At depth of 1 mm

0.192	0.199	0.191	0.194	0.192
0.224	0.214	0.232	0.233	0.208
0.191	0.227	0.216	0.210	0.185
0.168	0.197	0.222	0.194	0.211
0.176	0.205	0.205	0.189	0.171

b. At depth of 3 mm

0.150	0.154	0.145	0.148	0.152
0.168	0.166	0.176	0.179	0.165
0.152	0.170	0.166	0.158	0.147
0.139	0.157	0.165	0.152	0.160
0.144	0.160	0.156	0.143	0.135

c. At depth of 5 mm

0.116	0.118	0.109	0.112	0.120
0.125	0.130	0.132	0.136	0.130
0.120	0.126	0.127	0.117	0.117
0.114	0.126	0.121	0.118	0.121
0.117	0.123	0.117	0.107	0.105

d. At depth of 7 mm

0.091	0.092	0.085	0.087	0.098
0.096	0.104	0.101	0.105	0.104
0.096	0.096	0.100	0.087	0.096
0.094	0.102	0.090	0.093	0.092
0.096	0.095	0.089	0.081	0.082

e. At depth of 9 mm

0.076	0.076	0.072	0.073	0.084
0.080	0.088	0.082	0.086	0.085
0.079	0.079	0.084	0.069	0.083
0.078	0.087	0.072	0.078	0.075
0.082	0.076	0.071	0.065	0.066

Table c. **Edge-on position (Configuration 2).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the base mode at 5.785 GHz.

$$1\text{-g SAR} = 0.180 \text{ W/kg}$$

a. At depth of 1 mm

0.206	0.242	0.232	0.227	0.196
0.248	0.253	0.233	0.214	0.224
0.238	0.251	0.229	0.233	0.238
0.227	0.241	0.225	0.243	0.243
0.256	0.308	0.274	0.251	0.227

b. At depth of 3 mm

0.187	0.201	0.194	0.188	0.172
0.205	0.215	0.200	0.188	0.191
0.206	0.210	0.190	0.193	0.196
0.188	0.203	0.192	0.207	0.198
0.214	0.245	0.222	0.210	0.207

c. At depth of 5 mm

0.170	0.169	0.164	0.159	0.154
0.174	0.185	0.174	0.168	0.165
0.181	0.177	0.161	0.162	0.164
0.159	0.173	0.167	0.179	0.163
0.181	0.197	0.182	0.177	0.186

d. At depth of 7 mm

0.157	0.147	0.144	0.138	0.142
0.154	0.165	0.154	0.152	0.148
0.161	0.153	0.140	0.142	0.140
0.138	0.148	0.149	0.158	0.139
0.158	0.165	0.155	0.153	0.165

e. At depth of 9 mm

0.146	0.135	0.132	0.127	0.135
0.145	0.153	0.141	0.142	0.139
0.147	0.137	0.129	0.131	0.125
0.127	0.131	0.138	0.144	0.126
0.145	0.147	0.139	0.137	0.144

Table d. **Edge-on position (Configuration 2).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the turbo mode at 5.25 GHz.

1-g SAR = 0.103 W/kg

a. At depth of 1 mm

0.159	0.167	0.168	0.138	0.161
0.163	0.146	0.127	0.151	0.155
0.142	0.157	0.140	0.173	0.173
0.135	0.139	0.141	0.161	0.133
0.111	0.103	0.121	0.123	0.081

b. At depth of 3 mm

0.130	0.138	0.138	0.115	0.132
0.129	0.120	0.109	0.122	0.127
0.117	0.127	0.117	0.139	0.137
0.110	0.110	0.118	0.126	0.106
0.095	0.093	0.096	0.099	0.080

c. At depth of 5 mm

0.108	0.115	0.115	0.097	0.110
0.102	0.099	0.093	0.099	0.105
0.098	0.104	0.100	0.113	0.108
0.089	0.089	0.100	0.098	0.085
0.083	0.084	0.077	0.081	0.078

d. At depth of 7 mm

0.091	0.096	0.097	0.083	0.093
0.083	0.084	0.081	0.083	0.088
0.084	0.087	0.088	0.093	0.087
0.073	0.075	0.086	0.079	0.073
0.074	0.079	0.063	0.068	0.074

e. At depth of 9 mm

0.081	0.083	0.085	0.073	0.083
0.072	0.074	0.071	0.075	0.078
0.077	0.077	0.081	0.080	0.074
0.062	0.069	0.076	0.068	0.067
0.068	0.075	0.056	0.060	0.067

Table e. **Edge-on position (Configuration 2).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the turbo mode at 5.8 GHz.

$$1\text{-g SAR} = 0.110 \text{ W/kg}$$

a. At depth of 1 mm

0.172	0.160	0.180	0.164	0.174
0.169	0.168	0.166	0.196	0.170
0.186	0.185	0.184	0.163	0.170
0.148	0.177	0.181	0.133	0.140
0.105	0.108	0.112	0.094	0.004

b. At depth of 3 mm

0.142	0.135	0.147	0.141	0.139
0.137	0.138	0.134	0.153	0.142
0.146	0.146	0.143	0.131	0.134
0.129	0.136	0.141	0.119	0.112
0.086	0.098	0.090	0.077	0.023

c. At depth of 5 mm

0.120	0.117	0.121	0.123	0.112
0.113	0.114	0.109	0.120	0.121
0.117	0.117	0.112	0.108	0.107
0.113	0.107	0.111	0.106	0.090
0.073	0.090	0.074	0.062	0.038

d. At depth of 7 mm

0.104	0.105	0.104	0.109	0.095
0.096	0.098	0.093	0.098	0.106
0.098	0.097	0.090	0.093	0.087
0.098	0.089	0.093	0.096	0.076
0.066	0.083	0.064	0.051	0.050

e. At depth of 9 mm

0.096	0.099	0.095	0.102	0.087
0.086	0.088	0.085	0.087	0.098
0.089	0.087	0.078	0.086	0.076
0.086	0.082	0.084	0.088	0.068
0.065	0.078	0.060	0.042	0.058

Table f. **End-on position (Configuration 3).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the base mode at 5.26 GHz.

1-g SAR = 0.227 W/kg

a. At depth of 1 mm

0.373	0.439	0.443	0.442	0.414
0.374	0.411	0.423	0.452	0.436
0.409	0.417	0.398	0.425	0.434
0.408	0.423	0.412	0.386	0.405
0.393	0.392	0.414	0.361	0.383

b. At depth of 3 mm

0.272	0.313	0.312	0.315	0.292
0.279	0.299	0.303	0.315	0.307
0.293	0.294	0.285	0.303	0.307
0.297	0.299	0.293	0.278	0.291
0.284	0.281	0.285	0.248	0.267

c. At depth of 5 mm

0.192	0.215	0.210	0.217	0.198
0.203	0.212	0.209	0.210	0.207
0.202	0.200	0.198	0.208	0.208
0.210	0.203	0.200	0.195	0.203
0.198	0.194	0.185	0.161	0.178

d. At depth of 7 mm

0.135	0.145	0.138	0.145	0.133
0.147	0.148	0.142	0.138	0.137
0.137	0.133	0.135	0.140	0.138
0.145	0.135	0.134	0.135	0.139
0.136	0.132	0.114	0.102	0.114

e. At depth of 9 mm

0.100	0.105	0.094	0.102	0.096
0.110	0.108	0.102	0.100	0.095
0.097	0.093	0.097	0.100	0.098
0.104	0.095	0.093	0.100	0.099
0.099	0.093	0.071	0.069	0.077

Table g. **End-on position (Configuration 3).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the base mode at 5.785 GHz.

1-g SAR = 0.113 W/kg

a. At depth of 1 mm

0.191	0.162	0.182	0.170	0.182
0.164	0.163	0.188	0.170	0.182
0.150	0.164	0.164	0.171	0.177
0.159	0.153	0.176	0.191	0.210
0.159	0.153	0.183	0.176	0.228

b. At depth of 3 mm

0.145	0.129	0.141	0.138	0.141
0.129	0.132	0.140	0.134	0.141
0.118	0.135	0.129	0.131	0.132
0.124	0.118	0.129	0.153	0.162
0.120	0.118	0.138	0.132	0.168

c. At depth of 5 mm

0.109	0.104	0.110	0.112	0.108
0.102	0.108	0.103	0.105	0.109
0.094	0.112	0.102	0.101	0.097
0.096	0.091	0.095	0.122	0.124
0.091	0.091	0.104	0.099	0.121

d. At depth of 7 mm

0.085	0.086	0.087	0.093	0.084
0.082	0.089	0.079	0.085	0.088
0.077	0.093	0.081	0.079	0.074
0.077	0.073	0.072	0.099	0.097
0.070	0.073	0.079	0.076	0.087

e. At depth of 9 mm

0.072	0.075	0.073	0.079	0.070
0.069	0.077	0.066	0.073	0.076
0.070	0.080	0.067	0.067	0.062
0.066	0.063	0.062	0.083	0.080
0.059	0.063	0.064	0.063	0.067

Table h. **End-on position (Configuration 3).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the turbo mode at 5.25 GHz.

1-g SAR = 0.148 W/kg

a. At depth of 1 mm

0.236	0.229	0.227	0.242	0.215
0.311	0.282	0.265	0.228	0.276
0.277	0.247	0.255	0.269	0.223
0.299	0.280	0.246	0.258	0.248
0.250	0.272	0.240	0.219	0.271

b. At depth of 3 mm

0.178	0.173	0.169	0.179	0.163
0.226	0.207	0.194	0.173	0.202
0.198	0.182	0.184	0.196	0.168
0.213	0.202	0.179	0.186	0.181
0.174	0.190	0.167	0.159	0.185

c. At depth of 5 mm

0.133	0.129	0.125	0.131	0.122
0.161	0.149	0.140	0.130	0.145
0.138	0.131	0.130	0.140	0.127
0.147	0.141	0.127	0.130	0.129
0.117	0.127	0.111	0.112	0.119

d. At depth of 7 mm

0.102	0.098	0.096	0.099	0.093
0.116	0.108	0.104	0.100	0.105
0.097	0.094	0.093	0.101	0.098
0.101	0.097	0.091	0.090	0.092
0.079	0.083	0.072	0.079	0.072

e. At depth of 9 mm

0.084	0.079	0.081	0.081	0.077
0.089	0.084	0.084	0.083	0.080
0.076	0.072	0.074	0.078	0.081
0.075	0.070	0.070	0.067	0.070
0.060	0.059	0.051	0.059	0.045

Table i. **End-on position (Configuration 3).** The SARs measured for the Ambit Microsystems 802.11a Wireless Antenna A built into Agency Series PP2170 Laptop Computer for the turbo mode at 5.8 GHz.

1-g SAR = 0.110 W/kg

a. At depth of 1 mm

0.170	0.211	0.193	0.205	0.170
0.124	0.176	0.178	0.189	0.160
0.161	0.188	0.242	0.201	0.149
0.146	0.160	0.172	0.179	0.215
0.157	0.223	0.149	0.221	0.189

b. At depth of 3 mm

0.126	0.153	0.149	0.152	0.128
0.102	0.132	0.129	0.141	0.116
0.122	0.142	0.173	0.150	0.113
0.118	0.123	0.124	0.125	0.165
0.116	0.165	0.108	0.160	0.134

c. At depth of 5 mm

0.094	0.110	0.114	0.112	0.095
0.084	0.099	0.093	0.103	0.083
0.093	0.107	0.122	0.110	0.086
0.095	0.095	0.088	0.085	0.124
0.086	0.119	0.079	0.112	0.092

d. At depth of 7 mm

0.073	0.079	0.089	0.083	0.072
0.072	0.076	0.068	0.076	0.063
0.072	0.085	0.086	0.082	0.066
0.079	0.074	0.062	0.060	0.092
0.066	0.085	0.061	0.077	0.061

e. At depth of 9 mm

0.065	0.063	0.074	0.066	0.059
0.065	0.063	0.056	0.059	0.055
0.061	0.074	0.067	0.064	0.055
0.068	0.062	0.048	0.049	0.071
0.056	0.063	0.054	0.056	0.042

Table j. The coarse scan measured SAR distribution for region 1. The SARs were measured with a resolution of 8 mm.

0.021	0.042	0.068	0.094	0.094	0.094	0.094
0.110	0.136	0.157	0.157	0.147	0.126	0.115
0.136	0.178	0.215	0.241	0.236	0.210	0.178
0.199	0.267	0.330	0.362	0.335	0.262	0.210
0.220	0.304	0.383	0.435	0.398	0.320	0.252
0.225	0.299	0.377	0.404	0.362	0.293	0.236
0.194	0.241	0.273	0.299	0.273	0.236	0.194
0.142	0.178	0.204	0.225	0.215	0.183	0.157
0.121	0.147	0.168	0.173	0.162	0.152	0.142
0.136	0.152	0.162	0.168	0.152	0.136	0.131

Table k. The coarse scan measured SAR distribution for region 2. The SARs were measured with a resolution of 8 mm.

0.011	0.016	0.023	0.025	0.028	0.028	0.021
0.033	0.030	0.026	0.026	0.028	0.025	0.026
0.042	0.035	0.028	0.026	0.030	0.026	0.030
0.026	0.028	0.031	0.030	0.033	0.031	0.033
0.031	0.035	0.033	0.031	0.031	0.030	0.028
0.026	0.033	0.033	0.030	0.028	0.028	0.026
0.028	0.028	0.031	0.033	0.035	0.033	0.028
0.035	0.031	0.026	0.026	0.030	0.031	0.028
0.033	0.038	0.035	0.028	0.026	0.028	0.028
0.040	0.035	0.031	0.026	0.030	0.033	0.028

Table l. The coarse scan measured SAR distribution for region 3. The SARs were measured with a resolution of 8 mm.

0.018	0.004	0.021	0.023	0.026	0.025	0.023
0.026	0.028	0.028	0.028	0.030	0.028	0.028
0.023	0.025	0.028	0.028	0.028	0.030	0.030
0.025	0.028	0.030	0.031	0.030	0.030	0.023
0.030	0.028	0.028	0.030	0.030	0.028	0.028
0.030	0.030	0.030	0.030	0.028	0.028	0.028
0.030	0.030	0.026	0.028	0.028	0.028	0.031
0.030	0.031	0.031	0.031	0.031	0.033	0.031
0.028	0.030	0.033	0.035	0.037	0.031	0.030
0.031	0.030	0.031	0.031	0.031	0.033	0.031

Table m. The coarse scan measured SAR distribution for region 4. The SARs were measured with a resolution of 8 mm.

0.010	0.004	0.020	0.021	0.021	0.020	0.021
0.024	0.025	0.028	0.025	0.025	0.024	0.020
0.025	0.025	0.025	0.021	0.022	0.022	0.024
0.027	0.022	0.022	0.024	0.022	0.021	0.022
0.028	0.027	0.025	0.022	0.024	0.027	0.027
0.025	0.025	0.028	0.028	0.028	0.028	0.028
0.025	0.025	0.024	0.027	0.025	0.025	0.024
0.028	0.027	0.024	0.024	0.024	0.025	0.025
0.028	0.025	0.027	0.025	0.027	0.027	0.024
0.025	0.025	0.027	0.028	0.025	0.025	0.025

Table n. The coarse scan measured SAR distribution for region 5. The SARs were measured with a resolution of 8 mm.

0.014	0.000	0.017	0.018	0.020	0.021	0.020
0.021	0.022	0.024	0.025	0.022	0.021	0.022
0.022	0.024	0.022	0.022	0.022	0.022	0.022
0.025	0.025	0.022	0.022	0.021	0.024	0.022
0.024	0.024	0.022	0.024	0.024	0.024	0.024
0.027	0.025	0.024	0.024	0.024	0.025	0.025
0.027	0.024	0.024	0.025	0.022	0.024	0.022
0.025	0.025	0.024	0.022	0.024	0.024	0.024
0.024	0.025	0.027	0.025	0.024	0.024	0.022
0.027	0.024	0.025	0.027	0.027	0.024	0.024

Table o. The coarse scan measured SAR distribution for region 6. The SARs were measured with a resolution of 8 mm.

0.011	0.004	0.017	0.018	0.017	0.018	0.017
0.022	0.021	0.020	0.020	0.021	0.021	0.018
0.024	0.022	0.018	0.018	0.020	0.020	0.020
0.024	0.025	0.024	0.024	0.027	0.021	0.021
0.022	0.021	0.024	0.022	0.021	0.021	0.022
0.021	0.021	0.020	0.022	0.022	0.022	0.021
0.024	0.021	0.020	0.017	0.020	0.020	0.020
0.025	0.022	0.020	0.021	0.021	0.022	0.021
0.027	0.028	0.025	0.022	0.021	0.021	0.024
0.022	0.022	0.022	0.024	0.024	0.022	0.024

Table p. The coarse scan measured SAR distribution for region 7. The SARs were measured with a resolution of 8 mm.

0.022	0.008	0.007	0.014	0.018	0.017	0.010
0.022	0.022	0.021	0.022	0.022	0.018	0.017
0.021	0.021	0.018	0.021	0.022	0.027	0.024
0.024	0.021	0.021	0.022	0.027	0.028	0.024
0.024	0.025	0.024	0.025	0.025	0.021	0.021
0.021	0.021	0.020	0.020	0.021	0.021	0.021
0.022	0.022	0.020	0.018	0.021	0.024	0.022
0.028	0.028	0.025	0.024	0.022	0.024	0.022
0.027	0.027	0.025	0.025	0.022	0.024	0.025
0.025	0.027	0.027	0.027	0.024	0.021	0.028

Table q. The coarse scan measured SAR distribution for region 8. The SARs were measured with a resolution of 8 mm.

0.017	0.008	0.008	0.013	0.014	0.017	0.020
0.024	0.027	0.024	0.022	0.022	0.022	0.022
0.024	0.024	0.027	0.024	0.027	0.024	0.021
0.022	0.022	0.025	0.025	0.022	0.024	0.021
0.022	0.024	0.027	0.021	0.022	0.025	0.027
0.025	0.025	0.025	0.022	0.021	0.021	0.025
0.025	0.024	0.022	0.028	0.025	0.024	0.024
0.021	0.024	0.025	0.027	0.027	0.022	0.024
0.021	0.022	0.021	0.020	0.022	0.022	0.025
0.021	0.024	0.022	0.022	0.025	0.025	0.024

Table r. The coarse scan measured SAR distribution for region 9. The SARs were measured with a resolution of 8 mm.

0.007	0.004	0.025	0.040	0.018	0.025	0.015
0.014	0.010	0.011	0.011	0.013	0.017	0.017
0.018	0.015	0.014	0.018	0.025	0.015	0.013
0.017	0.017	0.017	0.014	0.017	0.014	0.014
0.017	0.021	0.024	0.020	0.017	0.017	0.021
0.021	0.021	0.018	0.015	0.020	0.024	0.027
0.020	0.017	0.017	0.017	0.014	0.015	0.021
0.014	0.013	0.014	0.017	0.020	0.025	0.025
0.018	0.021	0.021	0.015	0.024	0.027	0.025
0.020	0.021	0.018	0.020	0.021	0.021	0.024

Table s. The coarse scan measured SAR distribution for region 10. The SARs were measured with a resolution of 8 mm.

0.014	0.004	0.013	0.021	0.021	0.028	0.021
0.013	0.017	0.015	0.021	0.020	0.013	0.018
0.010	0.015	0.014	0.013	0.018	0.024	0.017
0.011	0.011	0.011	0.014	0.014	0.018	0.015
0.013	0.013	0.010	0.013	0.013	0.015	0.011
0.013	0.013	0.014	0.020	0.020	0.014	0.013
0.020	0.013	0.015	0.014	0.015	0.015	0.018
0.017	0.018	0.018	0.013	0.010	0.004	0.014
0.022	0.020	0.015	0.017	0.020	0.018	0.015
0.014	0.018	0.015	0.017	0.020	0.018	0.017

Table t. The coarse scan measured SAR distribution for region 11. The SARs were measured with a resolution of 8 mm.

0.006	0.015	0.014	0.014	0.020	0.020	0.018
0.013	0.013	0.017	0.013	0.010	0.013	0.011
0.010	0.013	0.008	0.008	0.008	0.008	0.014
0.011	0.010	0.010	0.013	0.013	0.010	0.015
0.014	0.014	0.013	0.011	0.011	0.014	0.017
0.013	0.014	0.013	0.014	0.011	0.011	0.013
0.013	0.015	0.014	0.015	0.015	0.014	0.014
0.015	0.017	0.014	0.013	0.014	0.014	0.015
0.017	0.018	0.020	0.018	0.015	0.017	0.015
0.014	0.015	0.015	0.018	0.017	0.015	0.015

Table u. The coarse scan measured SAR distribution for region 12. The SARs were measured with a resolution of 8 mm.

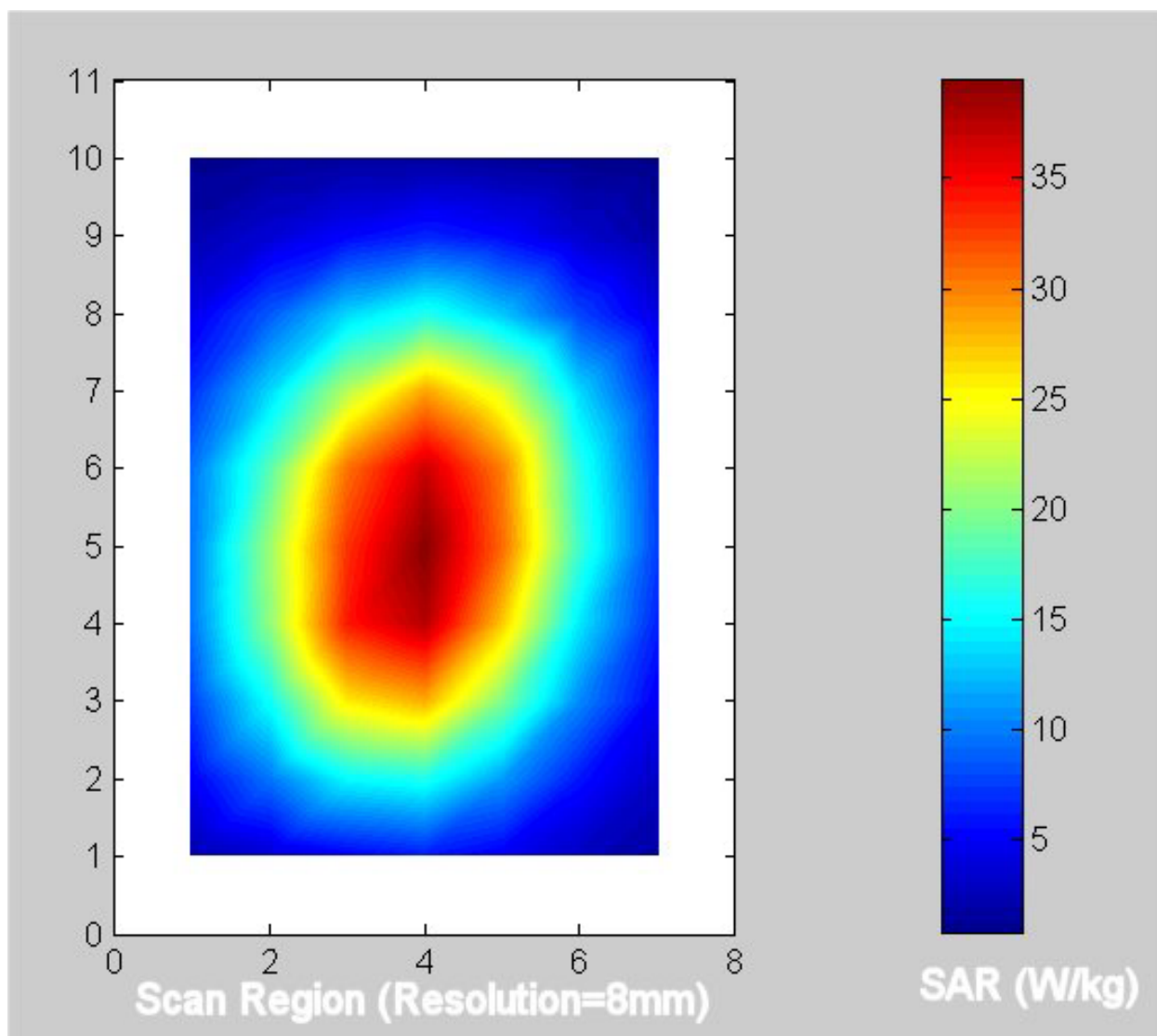
0.000	0.001	0.011	0.014	0.013	0.011	0.011
0.015	0.018	0.018	0.017	0.018	0.011	0.013
0.015	0.014	0.014	0.015	0.021	0.022	0.021
0.018	0.017	0.013	0.014	0.015	0.020	0.021
0.015	0.015	0.014	0.015	0.014	0.014	0.014
0.015	0.015	0.018	0.017	0.013	0.020	0.014
0.021	0.017	0.017	0.014	0.013	0.017	0.021
0.014	0.014	0.015	0.021	0.021	0.018	0.024
0.014	0.017	0.015	0.017	0.020	0.018	0.021
0.018	0.015	0.013	0.015	0.018	0.015	0.020

APPENDIX I

SAR System Verification for March 26, 2003

The measured SAR distribution for the peak 1-g SAR region using a dipole at 1900 MHz

For March 26, 2003 - The dipole SAR Plot



$$1\text{-g SAR} = 36.429 \text{ W/kg}$$

a. At depth of 1 mm

53.762	55.836	59.589	59.799	57.057
54.483	57.559	60.777	58.611	58.029
55.664	60.909	61.279	60.588	57.654
53.729	57.063	60.271	62.851	60.032
54.595	58.035	58.456	61.047	57.326

b. At depth of 3 mm

42.335	43.720	45.971	45.961	44.058
42.792	44.951	47.136	45.659	44.766
43.260	46.801	47.574	46.852	45.031
42.424	44.768	46.913	48.267	46.197
42.459	45.108	45.779	46.933	44.942

c. At depth of 5 mm

32.612	33.483	34.626	34.479	33.229
32.906	34.321	35.683	34.753	33.739
32.874	35.106	36.070	35.379	34.366
32.785	34.362	35.666	36.147	34.682
32.304	34.265	35.046	35.206	34.431

d. At depth of 7 mm

24.594	25.125	25.552	25.353	24.569
24.824	25.669	26.420	25.895	24.949
24.505	25.825	26.766	26.169	25.660
24.813	25.845	26.532	26.493	25.488
24.131	25.506	26.259	25.866	25.793

e. At depth of 9 mm

18.279	18.646	18.751	18.583	18.079
18.547	18.994	19.347	19.083	18.397
18.154	18.956	19.662	19.220	18.913
18.506	19.218	19.509	19.305	18.616
17.940	18.831	19.417	18.914	19.029
18.998	19.502	19.648	19.372	18.742