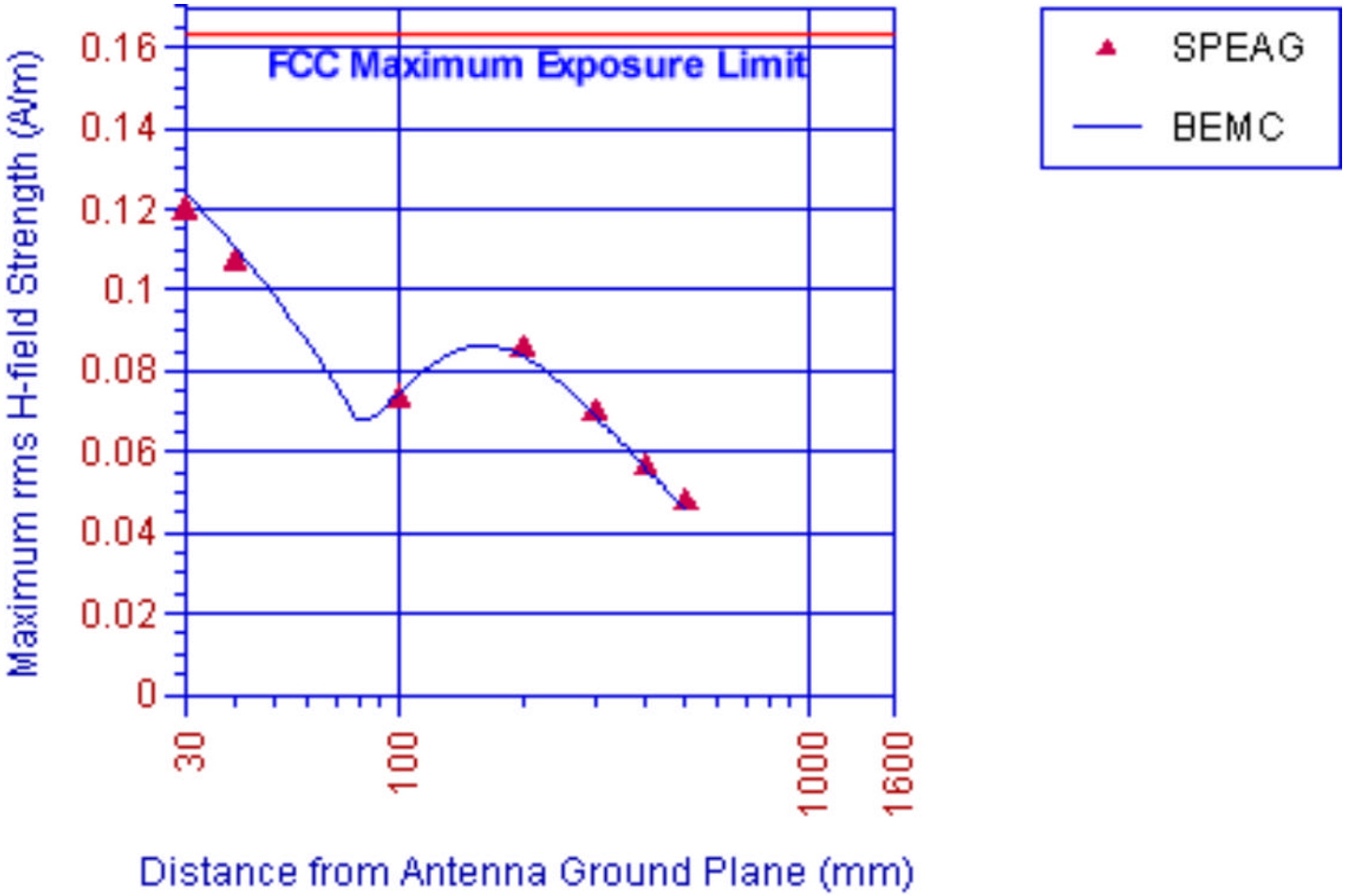

Figure 5.38. Comparison of FDTD derived values of magnetic field strength by BEMC and measured values by SPEAG from AT&T antenna.

6 FDTD Calculation and Measurements of SAR in Kuster Head and Shoulders Homogeneous Model

6.1 Orientation with Tip of Nose in Contact with Radome and 9 mm Below Center of Four Patch Array

FDTD calculations were made of the peak and 1-gram average of the SARs in the Kuster homogeneous head model (described in section 3.2) exposed to the AT&T RU antenna. The results were compared to the measurements made by SPEAG described in Appendix A. The electrical properties of the head tissue corresponded to a relative permittivy of 41.0 and a conductivity of 1.69 S/m, which SPEAG specifies for modeling homogeneous head tissue in the PCS band based on their measurements at 1.8 GHz. The head was exposed with the face toward the antenna with the nose in direct contact with the radome at 9-mm below the geometric center of the 4-patch array. Graphical SAR data files and plots calculated throughout the entire head model were scaled for an input power of 79.62 mW to the antenna which corresponds to a far-field effective radiated power of 2.54 watts from the antenna with no models present.

Table 6.1 summarizes the calculated results of both the peak and average SARs calculated for each 1-mm thick slice in the xy plane as well as for the entire exposed head model. The first column of the table lists the first 17 characters of the name of the file containing the SAR data for the slices numbered from 11 to 344, corresponding to the distance in mm from the fdtd mesh origin in the z direction. The second and third columns of the table give the x and y coordinates in mm of the cell from the FDTD mesh origin within the slice experiencing the highest SAR. The fourth column gives the maximum SAR, the fifth column gives the SAR as averaged over the slice and the last column gives the number of cells within the slice. It may be noted from the table that the maximum SAR of 0.194 W/kg for the entire head model is in the 148^{th} slice (file mansar1.xy148.sar) at x=81 mm and y=109 mm and the average SAR for the 19114 cells for that slice is 0.007947 W/kg. It can also be seen at the bottom of the table that the SAR as averaged over the 7444294 cells of the entire head is 0.004295W/kg.

The safe exposure standards in the United States for the public or uncontrolled environment including the FCC MPLs are based on limiting the maximum SAR as averaged over any gram of tissue in the shape of a cube to 1.6 W/kg and the SAR as averaged over the whole body to 0.08 W/kg. Thus the FDTD calculated SAR distribution data must be converted some way to reflect the average over any gram of tissue in the shape of a cube. So far there is no standardization on how this averaging process should be done to account for the irregular shape of tissue

boundaries such as encountered at the ears, nose, mouth, etc. If the averaging routine maintains the 1-gram cube entirely within the tissue boundaries so that a flat face of the cube cannot emerge outside of the tissue boundaries, the averaging process may miss regions of high SAR which commonly occur at the surface or at locations where there are sharp curves of the tissue surface. This will result in a lower average SAR than would be the case if the surfaces of the cube were allowed to extend beyond the tissue boundaries in order not to miss any tissue with high SAR near an irregular boundary. The latter could include a large amount of air in the averaging volume, requiring the cube to become larger to encompass the required gram of tissue thereby allowing more surface tissue with the higher SARs to weight the averaging process. In order to insure that the averaging process covers the "worst case" scenario, the FDTD averaging routine used in this analysis considered a cube of space centered at each FDTD cell within the tissue. The cube was then allowed to expand until a gram of tissue was contained within its boundaries. When 1 gram of tissue (to within 1% accuracy) was contained in the cube the SAR was averaged over the entire cube and the average value was assigned to the cell at the center of the cube. It should be realized that this could lead to pessimistically higher values of SAR at distances from the tissue surface that are shorter than the dimension of the averaging cube. The routine could be made to be less pessimistic by imposing an additional condition that the face of the averaging cube not be extended into the air anymore than necessary to enclose all of the tissue below the outermost point of the tissue boundary. It could become rather complicated to get some general agreement among the dosimetry experts on the best way to do this.

Table 6.2 illustrates the results of the 1-gram averaging of the fdtd output data. The format is essentially the same as used in Table 6.1, except the results can now be related to the FCC MPL. It may be noted from the table that the highest 1-g average SAR of 0.1319 W/kg occurs in the slice at z=144 mm, x=81 mm and y=112 mm. This is more than 12 times below the maximum permitted level of 1.6 W/kg. The SAR as averaged over the entire head consisting of 7,444,294 fdtd cells was calculated to be 0.004319 W/kg. However, the whole head average of 0.004295 W/kg as calculated by 1-mm fdtd cubes given in Table 6.1 is more accurate since there is considerable overlapping of the 1 gram cubes in determining the whole head average given in Table 6.2. Assuming an average head tissue density the same as water, the total mass of the phantom head tissue is 7,444,294/1,000,000 = 7.444 kg. Therefore the total absorbed power is 0.004295x7.444= 0.031973 W = 31.973mW which is 40.2% of the antenna input power. Though this calculation doesn't indicate what the whole-body averaged SAR would be, the whole body could not absorb any more than the full 79.62-mW input power to the antenna which for a 70 Kg man would correspond to a whole-body average SAR of 0.001377 W/kg. Thus we may conclude that the whole-body averaged SAR for an adult man with a head similar to that of the Kuster phantom head would be somewhere between 0.001377 and 0.004295 W/kg or from 18 to 58 times less than that allowed by the FCC MPL of 0.08 W/kg.

Table 6.1. Slice and Whole Head Model Peak and average SAR (averaged over slice) for Kuster Head and Shoulders Model Exposed to AT&T RU Antenna with Nose in Contact with Radome 9 mm Below Middle of Patch Array and (slice file number is distance in mm from FDTD space rectangular coordinates origin in z direction).

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy11.sar	124	121	0.6038E-02	0.3086E-02	52
mansar1.xy12.sar	146	260	0.1036E+00	0.5861E-02	33632
mansar1.xy13.sar	147	260	0.7903E-01	0.5933E-02	33346
mansar1.xy14.sar	149	261	0.8060E-01	0.5890E-02	33090
mansar1.xy15.sar	145	252	0.6733E-01	0.5643E-02	32786
mansar1.xy16.sar	151	260	0.6439E-01	0.5275E-02	32492
mansar1.xy17.sar	150	256	0.4927E-01	0.4824E-02	32150
mansar1.xy18.sar	148	249	0.3758E-01	0.4378E-02	31818
mansar1.xy19.sar	130	168	0.3740E-01	0.3981E-02	31464
mansar1.xy20.sar	130	174	0.4980E-01	0.3647E-02	31096
mansar1.xy21.sar	131	171	0.6096E-01	0.3391E-02	30710
mansar1.xy22.sar	132	178	0.5679E-01	0.3205E-02	30352
mansar1.xy23.sar	133	169	0.5400E-01	0.3092E-02	29996
mansar1.xy24.sar	134	169	0.6729E-01	0.3036E-02	29646
mansar1.xy25.sar	134	173	0.6564E-01	0.3000E-02	29282
mansar1.xy26.sar	136	173	0.7206E-01	0.3006E-02	28940
mansar1.xy27.sar	136	173	0.8821E-01	0.3037E-02	28596
mansar1.xy28.sar	137	176	0.8358E-01	0.3061E-02	28262
mansar1.xy29.sar	138	178	0.9041E-01	0.3119E-02	27952
mansar1.xy30.sar	138	173	0.1018E+00	0.3176E-02	27624
mansar1.xy31.sar	138	173	0.6471E-01	0.3210E-02	27310
mansar1.xy32.sar	139	180	0.6914E-01	0.3252E-02	27000
mansar1.xy33.sar	139	177	0.8268E-01	0.3289E-02	26678
mansar1.xy34.sar	139	174	0.9320E-01	0.3305E-02	26348
mansar1.xy35.sar	140	179	0.7920E-01	0.3281E-02	26013
mansar1.xy36.sar	140	178	0.8538E-01	0.3262E-02	25669
mansar1.xy37.sar	140	177	0.9378E-01	0.3236E-02	25256
mansar1.xy38.sar	140	176	0.1113E+00	0.3215E-02	24854
mansar1.xy39.sar	140	174	0.1203E+00	0.3198E-02	24478
mansar1.xy40.sar	141	182	0.1134E+00	0.3203E-02	24094
mansar1.xy41.sar	141	179	0.9123E-01	0.3234E-02	23752
mansar1.xy42.sar	140	178	0.1020E+00	0.3288E-02	23406
mansar1.xy43.sar	141	178	0.9686E-01	0.3367E-02	23082
mansar1.xy44.sar	141	181	0.1022E+00	0.3463E-02	22732
mansar1.xy45.sar	141	172	0.1007E+00	0.3555E-02	22406
mansar1.xy46.sar	141	180	0.1351E+00	0.3664E-02	22080
mansar1.xy47.sar	143	184	0.1041E+00	0.3736E-02	21748
mansar1.xy48.sar	144	186	0.9324E-01	0.3802E-02	21410
mansar1.xy49.sar	141	177	0.8796E-01	0.3855E-02	21102
mansar1.xy50.sar	142	182	0.1234E+00	0.3902E-02	20778
mansar1.xy51.sar	141	179	0.1372E+00	0.3932E-02	20478
mansar1.xy52.sar	141	179	0.1015E+00	0.3956E-02	20158
mansar1.xy53.sar	141	179	0.1024E+00	0.3968E-02	19878
mansar1.xy54.sar	141	176	0.8431E-01	0.3980E-02	19610
mansar1.xy55.sar	141	175	0.8542E-01	0.4003E-02	19326
mansar1.xy56.sar	141	178	0.7796E-01	0.4044E-02	19028
mansar1.xy57.sar	143	184	0.9735E-01	0.4080E-02	18714
mansar1.xy58.sar	140	175	0.9000E-01	0.4122E-02	18404
mansar1.xy59.sar	141	176	0.8421E-01	0.4177E-02	18106

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy60.sar	140	170	0.9652E-01	0.4242E-02	17800
mansar1.xy61.sar	141	180	0.8784E-01	0.4278E-02	17550
mansar1.xy62.sar	140	173	0.8657E-01	0.4323E-02	17248
mansar1.xy63.sar	140	175	0.8456E-01	0.4365E-02	17038
mansar1.xy64.sar	140	176	0.7617E-01	0.4403E-02	16772
mansar1.xy65.sar	139	172	0.6996E-01	0.4454E-02	16498
mansar1.xy66.sar	138	164	0.7103E-01	0.4489E-02	16238
mansar1.xy67.sar	141	181	0.7424E-01	0.4513E-02	16000
mansar1.xy68.sar	143	184	0.8908E-01	0.4529E-02	15752
mansar1.xy69.sar	139	177	0.7469E-01	0.4541E-02	15516
mansar1.xy70.sar	140	178	0.6286E-01	0.4547E-02	15286
mansar1.xy71.sar	138	170	0.6737E-01	0.4547E-02	15060
mansar1.xy72.sar	141	182	0.6598E-01	0.4547E-02	14844
mansar1.xy73.sar	139	178	0.7061E-01	0.4547E-02	14638
mansar1.xy74.sar	136	169	0.6747E-01	0.4529E-02	14480
mansar1.xy75.sar	135	162	0.6236E-01	0.4531E-02	14262
mansar1.xy76.sar	134	155	0.6435E-01	0.4525E-02	14072
mansar1.xy77.sar	134	158	0.5964E-01	0.4520E-02	13874
mansar1.xy78.sar	135	169	0.6549E-01	0.4513E-02	13686
mansar1.xy79.sar	134	162	0.6271E-01	0.4512E-02	13518
mansar1.xy80.sar	134	164	0.6214E-01	0.4512E-02	13360
mansar1.xy81.sar	134	165	0.5956E-01	0.4513E-02	13194
mansar1.xy82.sar	134	166	0.5939E-01	0.4512E-02	13066
mansar1.xy83.sar	132	154	0.6425E-01	0.4533E-02	12916
mansar1.xy84.sar	132	158	0.6146E-01	0.4541E-02	12794
mansar1.xy85.sar	132	160	0.6063E-01	0.4553E-02	12670
mansar1.xy86.sar	132	161	0.5917E-01	0.4574E-02	12548
mansar1.xy87.sar	133	169	0.6612E-01	0.4591E-02	12442
mansar1.xy88.sar	131	153	0.6080E-01	0.4584E-02	12398
mansar1.xy89.sar	131	160	0.6186E-01	0.4590E-02	12340
mansar1.xy90.sar	131	162	0.5894E-01	0.4623E-02	12232
mansar1.xy91.sar	132	169	0.6414E-01	0.4645E-02	12166
mansar1.xy92.sar	130	157	0.7198E-01	0.4677E-02	12082
mansar1.xy93.sar	130	159	0.6579E-01	0.4684E-02	12050
mansar1.xy94.sar	130	161	0.6643E-01	0.4690E-02	12002
mansar1.xy95.sar	131	166	0.6392E-01	0.4709E-02	11938
mansar1.xy96.sar	129	157	0.7386E-01	0.4729E-02	11890
mansar1.xy97.sar	129	159	0.6651E-01	0.4743E-02	11850
mansar1.xy98.sar	130	165	0.6504E-01	0.4743E-02	11816
mansar1.xy99.sar	129	162	0.6928E-01	0.4746E-02	11784
mansar1.xy100.sar	128	158	0.7466E-01	0.4756E-02	11746
mansar1.xy101.sar	128	159	0.6633E-01	0.4742E-02	11734
mansar1.xy102.sar	128	162	0.7157E-01	0.4722E-02	11724
mansar1.xy103.sar	128	164	0.7074E-01	0.4714E-02	11713
mansar1.xy104.sar	127	159	0.7268E-01	0.4699E-02	11712
mansar1.xy105.sar	127	162	0.7262E-01	0.4683E-02	11708
mansar1.xy106.sar	126	156	0.7303E-01	0.4668E-02	11706
mansar1.xy107.sar	126	162	0.7132E-01	0.4650E-02	11730
mansar1.xy108.sar	126	165	0.7150E-01	0.4626E-02	11746
mansar1.xy109.sar	125	165	0.8062E-01	0.4609E-02	11774
mansar1.xy110.sar	125	167	0.7908E-01	0.4592E-02	11824
mansar1.xy111.sar	122	157	0.9215E-01	0.4617E-02	11854
mansar1.xy112.sar	122	165	0.8395E-01	0.4754E-02	12002
mansar1.xy113.sar	122	168	0.7533E-01	0.5128E-02	12306
mansar1.xy114.sar	122	171	0.5917E-01	0.5653E-02	12688

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy115.sar	126	178	0.5639E-01	0.6236E-02	13390
mansar1.xy116.sar	80	151	0.5204E-01	0.6783E-02	13892
mansar1.xy117.sar	74	146	0.5256E-01	0.7145E-02	14290
mansar1.xy118.sar	74	145	0.5830E-01	0.7462E-02	14670
mansar1.xy119.sar	75	141	0.6135E-01	0.7724E-02	14984
mansar1.xy120.sar	72	164	0.6810E-01	0.7961E-02	15298
mansar1.xy121.sar	72	140	0.6971E-01	0.8233E-02	15594
mansar1.xy122.sar	73	136	0.7985E-01	0.8513E-02	15904
mansar1.xy123.sar	88	121	0.8125E-01	0.8803E-02	16146
mansar1.xy124.sar	80	126	0.8882E-01	0.9087E-02	16396
mansar1.xy125.sar	78	127	0.1030E+00	0.9330E-02	16616
mansar1.xy126.sar	78	178	0.1180E+00	0.9535E-02	16834
mansar1.xy127.sar	81	121	0.1069E+00	0.9706E-02	17044
mansar1.xy128.sar	78	123	0.1156E+00	0.9856E-02	17240
mansar1.xy129.sar	78	182	0.1168E+00	0.9990E-02	17416
mansar1.xy130.sar	80	120	0.1394E+00	0.1013E-01	17554
mansar1.xy131.sar	78	121	0.1459E+00	0.1026E-01	17668
mansar1.xy132.sar	81	117	0.1381E+00	0.1033E-01	17816
mansar1.xy133.sar	78	120	0.1459E+00	0.1037E-01	17940
mansar1.xy134.sar	81	116	0.1580E+00	0.1039E-01	18014
mansar1.xy135.sar	77	121	0.1571E+00	0.1036E-01	18104
mansar1.xy136.sar	83	113	0.1514E+00	0.1028E-01	18178
mansar1.xy137.sar	80	115	0.1520E+00	0.1014E-01	18230
mansar1.xy138.sar	78	117	0.1552E+00	0.9993E-02	18292
mansar1.xy139.sar	80	114	0.1663E+00	0.9815E-02	18308
mansar1.xy140.sar	81	113	0.1911E+00	0.9619E-02	18362
mansar1.xy141.sar	79	114	0.1732E+00	0.9400E-02	18418
mansar1.xy142.sar	82	111	0.1870E+00	0.9166E-02	18496
mansar1.xy143.sar	84	109	0.1796E+00	0.8966E-02	18554
mansar1.xy144.sar	82	110	0.1687E+00	0.8752E-02	18670
mansar1.xy145.sar	80	111	0.1712E+00	0.8543E-02	18772
mansar1.xy146.sar	80	194	0.1644E+00	0.8337E-02	18900
mansar1.xy147.sar	80	110	0.1711E+00	0.8143E-02	19008
mansar1.xy148.sar	81	109	0.1936E+00	0.7947E-02	19114
mansar1.xy149.sar	81	196	0.1790E+00	0.7736E-02	19246
mansar1.xy150.sar	79	110	0.1846E+00	0.7538E-02	19348
mansar1.xy151.sar	79	195	0.1650E+00	0.7328E-02	19466
mansar1.xy152.sar	81	107	0.1686E+00	0.7154E-02	19542
mansar1.xy153.sar	78	110	0.1698E+00	0.6991E-02	19640
mansar1.xy154.sar	80	107	0.1707E+00	0.6834E-02	19728
mansar1.xy155.sar	80	198	0.1532E+00	0.6662E-02	19848
mansar1.xy156.sar	78	196	0.1437E+00	0.6510E-02	19948
mansar1.xy157.sar	79	107	0.1606E+00	0.6342E-02	20070
mansar1.xy158.sar	81	106	0.1508E+00	0.6177E-02	20202
mansar1.xy159.sar	82	105	0.1433E+00	0.6006E-02	20354
mansar1.xy160.sar	83	104	0.1269E+00	0.5839E-02	20532
mansar1.xy161.sar	80	106	0.1382E+00	0.5666E-02	20688
mansar1.xy162.sar	78	107	0.1402E+00	0.5494E-02	20846
mansar1.xy163.sar	78	198	0.1184E+00	0.5316E-02	21014
mansar1.xy164.sar	82	201	0.1073E+00	0.5149E-02	21140
mansar1.xy165.sar	83	103	0.9839E-01	0.4979E-02	21278
mansar1.xy166.sar	83	202	0.9898E-01	0.4807E-02	21416
mansar1.xy167.sar	79	106	0.1015E+00	0.4651E-02	21526
mansar1.xy168.sar	81	104	0.9416E-01	0.4501E-02	21622
mansar1.xy169.sar	80	105	0.1103E+00	0.4342E-02	21752

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy170.sar	80	200	0.1004E+00	0.4188E-02	21874
mansar1.xy171.sar	79	106	0.9015E-01	0.4035E-02	21974
mansar1.xy172.sar	83	203	0.8824E-01	0.3885E-02	22128
mansar1.xy173.sar	84	204	0.8147E-01	0.3751E-02	22250
mansar1.xy174.sar	80	104	0.8924E-01	0.3630E-02	22348
mansar1.xy175.sar	82	203	0.9093E-01	0.3518E-02	22478
mansar1.xy176.sar	81	202	0.8516E-01	0.3407E-02	22614
mansar1.xy177.sar	80	103	0.7780E-01	0.3308E-02	22734
mansar1.xy178.sar	82	204	0.8198E-01	0.3218E-02	22896
mansar1.xy179.sar	84	206	0.8229E-01	0.3138E-02	23052
mansar1.xy180.sar	79	201	0.7664E-01	0.3075E-02	23180
mansar1.xy181.sar	85	208	0.6571E-01	0.3014E-02	23344
mansar1.xy182.sar	82	206	0.7437E-01	0.2967E-02	23514
mansar1.xy183.sar	79	203	0.6476E-01	0.2938E-02	23664
mansar1.xy184.sar	80	205	0.6455E-01	0.2921E-02	23822
mansar1.xy185.sar	79	204	0.6215E-01	0.2920E-02	23984
mansar1.xy186.sar	81	207	0.6328E-01	0.2947E-02	24186
mansar1.xy187.sar	80	206	0.6241E-01	0.2982E-02	24428
mansar1.xy188.sar	82	209	0.5937E-01	0.3047E-02	24658
mansar1.xy189.sar	82	209	0.5861E-01	0.3143E-02	24918
mansar1.xy190.sar	59	151	0.5620E-01	0.3185E-02	25100
mansar1.xy191.sar	60	151	0.5929E-01	0.3216E-02	25236
mansar1.xy192.sar	60	151	0.6171E-01	0.3241E-02	25422
mansar1.xy193.sar	61	151	0.6318E-01	0.3265E-02	25534
mansar1.xy194.sar	61	152	0.6413E-01	0.3281E-02	25692
mansar1.xy195.sar	62	152	0.6471E-01	0.3290E-02	25808
mansar1.xy196.sar	62	152	0.6507E-01	0.3301E-02	25944
mansar1.xy197.sar	63	152	0.6528E-01	0.3310E-02	26062
mansar1.xy198.sar	63	152	0.6574E-01	0.3322E-02	26194
mansar1.xy199.sar	63	152	0.6645E-01	0.3334E-02	26294
mansar1.xy200.sar	63	152	0.6767E-01	0.3342E-02	26438
mansar1.xy201.sar	63	153	0.6976E-01	0.3356E-02	26526
mansar1.xy202.sar	62	153	0.7327E-01	0.3356E-02	26628
mansar1.xy203.sar	56	157	0.8303E-01	0.3374E-02	26750
mansar1.xy204.sar	57	157	0.1060E+00	0.3390E-02	26816
mansar1.xy205.sar	54	154	0.8976E-01	0.3363E-02	26930
mansar1.xy206.sar	60	153	0.9407E-01	0.3361E-02	27006
mansar1.xy207.sar	56	153	0.1095E+00	0.3352E-02	27078
mansar1.xy208.sar	60	153	0.1035E+00	0.3330E-02	27160
mansar1.xy209.sar	58	156	0.1122E+00	0.3308E-02	27202
mansar1.xy210.sar	58	153	0.1306E+00	0.3271E-02	27260
mansar1.xy211.sar	62	153	0.1111E+00	0.3220E-02	27310
mansar1.xy212.sar	59	153	0.1203E+00	0.3205E-02	27350
mansar1.xy213.sar	60	155	0.1184E+00	0.3149E-02	27404
mansar1.xy214.sar	60	154	0.1194E+00	0.3107E-02	27442
mansar1.xy215.sar	64	153	0.1159E+00	0.3071E-02	27496
mansar1.xy216.sar	62	156	0.1222E+00	0.3035E-02	27550
mansar1.xy217.sar	62	153	0.1419E+00	0.3009E-02	27602
mansar1.xy218.sar	63	155	0.1404E+00	0.2967E-02	27652
mansar1.xy219.sar	63	154	0.1486E+00	0.2942E-02	27702
mansar1.xy220.sar	68	153	0.1136E+00	0.2913E-02	27764
mansar1.xy221.sar	68	153	0.1140E+00	0.2900E-02	27824
mansar1.xy222.sar	65	156	0.1153E+00	0.2889E-02	27888
mansar1.xy223.sar	65	153	0.1329E+00	0.2891E-02	27930
mansar1.xy224.sar	66	155	0.1199E+00	0.2877E-02	28016

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy225.sar	67	156	0.1351E+00	0.2872E-02	28094
mansar1.xy226.sar	67	153	0.1479E+00	0.2879E-02	28162
mansar1.xy227.sar	68	155	0.1376E+00	0.2878E-02	28244
mansar1.xy228.sar	69	157	0.1340E+00	0.2889E-02	28340
mansar1.xy229.sar	69	153	0.1734E+00	0.2914E-02	28448
mansar1.xy230.sar	70	158	0.1423E+00	0.2912E-02	28538
mansar1.xy231.sar	70	157	0.1534E+00	0.2934E-02	28652
mansar1.xy232.sar	70	155	0.1572E+00	0.2973E-02	28736
mansar1.xy233.sar	70	155	0.1154E+00	0.2993E-02	28878
mansar1.xy234.sar	70	158	0.1181E+00	0.3026E-02	28988
mansar1.xy235.sar	70	158	0.1150E+00	0.3068E-02	29122
mansar1.xy236.sar	83	93	0.1041E+00	0.3118E-02	29262
mansar1.xy237.sar	82	94	0.1017E+00	0.3173E-02	29406
mansar1.xy238.sar	82	93	0.1090E+00	0.3236E-02	29540
mansar1.xy239.sar	82	93	0.1087E+00	0.3312E-02	29702
mansar1.xy240.sar	78	99	0.1190E+00	0.3387E-02	29864
mansar1.xy241.sar	78	98	0.1282E+00	0.3476E-02	30012
mansar1.xy242.sar	78	97	0.1250E+00	0.3579E-02	30184
mansar1.xy243.sar	77	98	0.1174E+00	0.3684E-02	30324
mansar1.xy244.sar	76	100	0.1233E+00	0.3795E-02	30510
mansar1.xy245.sar	79	95	0.1359E+00	0.3883E-02	30644
mansar1.xy246.sar	78	96	0.1209E+00	0.3937E-02	30808
mansar1.xy247.sar	81	94	0.1175E+00	0.3982E-02	30912
mansar1.xy248.sar	82	94	0.1130E+00	0.4011E-02	30994
mansar1.xy249.sar	78	96	0.1423E+00	0.4042E-02	31060
mansar1.xy250.sar	75	99	0.1386E+00	0.4070E-02	31112
mansar1.xy251.sar	75	99	0.1152E+00	0.4086E-02	31172
mansar1.xy252.sar	80	95	0.1199E+00	0.4098E-02	31220
mansar1.xy253.sar	78	97	0.1490E+00	0.4107E-02	31252
mansar1.xy254.sar	75	100	0.1455E+00	0.4086E-02	31278
mansar1.xy255.sar	71	106	0.1315E+00	0.4043E-02	31310
mansar1.xy256.sar	77	99	0.1472E+00	0.3991E-02	31328
mansar1.xy257.sar	75	101	0.1390E+00	0.3946E-02	31340
mansar1.xy258.sar	72	107	0.1364E+00	0.3895E-02	31344
mansar1.xy259.sar	76	101	0.1521E+00	0.3816E-02	31348
mansar1.xy260.sar	73	106	0.1544E+00	0.3762E-02	31364
mansar1.xy261.sar	74	105	0.1443E+00	0.3711E-02	31374
mansar1.xy262.sar	80	97	0.1571E+00	0.3661E-02	31370
mansar1.xy263.sar	79	98	0.1419E+00	0.3625E-02	31372
mansar1.xy264.sar	72	110	0.1243E+00	0.3593E-02	31372
mansar1.xy265.sar	74	106	0.1269E+00	0.3595E-02	31372
mansar1.xy266.sar	79	98	0.1425E+00	0.3636E-02	31349
mansar1.xy267.sar	79	207	0.1304E+00	0.3668E-02	31324
mansar1.xy268.sar	78	101	0.1260E+00	0.3712E-02	31302
mansar1.xy269.sar	78	100	0.1471E+00	0.3765E-02	31276
mansar1.xy270.sar	80	98	0.1600E+00	0.3834E-02	31244
mansar1.xy271.sar	79	206	0.1483E+00	0.3892E-02	31212
mansar1.xy272.sar	74	108	0.1377E+00	0.3952E-02	31187
mansar1.xy273.sar	74	197	0.1297E+00	0.4011E-02	31157
mansar1.xy274.sar	75	106	0.1172E+00	0.4075E-02	31120
mansar1.xy275.sar	78	101	0.1400E+00	0.4132E-02	31088
mansar1.xy276.sar	79	100	0.1447E+00	0.4182E-02	31048
mansar1.xy277.sar	81	98	0.1428E+00	0.4242E-02	31000
mansar1.xy278.sar	80	206	0.1381E+00	0.4285E-02	30930
mansar1.xy279.sar	74	196	0.1168E+00	0.4311E-02	30884

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy280.sar	78	102	0.1323E+00	0.4340E-02	30806
mansar1.xy281.sar	78	203	0.1345E+00	0.4359E-02	30728
mansar1.xy282.sar	79	204	0.1291E+00	0.4363E-02	30664
mansar1.xy283.sar	81	206	0.1203E+00	0.4363E-02	30580
mansar1.xy284.sar	79	102	0.1282E+00	0.4351E-02	30468
mansar1.xy285.sar	79	203	0.1257E+00	0.4335E-02	30378
mansar1.xy286.sar	82	206	0.1150E+00	0.4303E-02	30292
mansar1.xy287.sar	78	106	0.1101E+00	0.4273E-02	30170
mansar1.xy288.sar	78	200	0.1128E+00	0.4229E-02	30054
mansar1.xy289.sar	78	108	0.1059E+00	0.4183E-02	29946
mansar1.xy290.sar	81	103	0.1100E+00	0.4143E-02	29786
mansar1.xy291.sar	81	202	0.1066E+00	0.4083E-02	29648
mansar1.xy292.sar	80	106	0.1102E+00	0.4037E-02	29490
mansar1.xy293.sar	80	199	0.1053E+00	0.3974E-02	29316
mansar1.xy294.sar	86	205	0.9437E-01	0.3929E-02	29148
mansar1.xy295.sar	82	106	0.9106E-01	0.3859E-02	28950
mansar1.xy296.sar	81	109	0.8290E-01	0.3815E-02	28756
mansar1.xy297.sar	83	107	0.7638E-01	0.3768E-02	28530
mansar1.xy298.sar	85	106	0.8401E-01	0.3715E-02	28282
mansar1.xy299.sar	88	104	0.7776E-01	0.3667E-02	28078
mansar1.xy300.sar	88	201	0.6659E-01	0.3602E-02	27840
mansar1.xy301.sar	87	199	0.7061E-01	0.3585E-02	27650
mansar1.xy302.sar	88	199	0.6395E-01	0.3543E-02	27346
mansar1.xy303.sar	89	199	0.6357E-01	0.3510E-02	27056
mansar1.xy304.sar	90	199	0.6231E-01	0.3486E-02	26710
mansar1.xy305.sar	91	199	0.5671E-01	0.3460E-02	26366
mansar1.xy306.sar	93	106	0.5039E-01	0.3440E-02	26008
mansar1.xy307.sar	93	108	0.5121E-01	0.3428E-02	25634
mansar1.xy308.sar	93	110	0.4983E-01	0.3404E-02	25254
mansar1.xy309.sar	93	112	0.4560E-01	0.3385E-02	24840
mansar1.xy310.sar	93	115	0.4463E-01	0.3373E-02	24428
mansar1.xy311.sar	111	214	0.4474E-01	0.3362E-02	24006
mansar1.xy312.sar	99	199	0.4866E-01	0.3355E-02	23596
mansar1.xy313.sar	96	114	0.3739E-01	0.3361E-02	23182
mansar1.xy314.sar	100	109	0.3613E-01	0.3362E-02	22718
mansar1.xy315.sar	116	214	0.3452E-01	0.3367E-02	22268
mansar1.xy316.sar	118	214	0.3591E-01	0.3387E-02	21842
mansar1.xy317.sar	108	200	0.3131E-01	0.3414E-02	21362
mansar1.xy318.sar	121	214	0.3386E-01	0.3436E-02	20854
mansar1.xy319.sar	112	102	0.3330E-01	0.3462E-02	20358
mansar1.xy320.sar	114	205	0.3511E-01	0.3478E-02	19812
mansar1.xy321.sar	106	118	0.2761E-01	0.3500E-02	19306
mansar1.xy322.sar	108	115	0.2778E-01	0.3535E-02	18796
mansar1.xy323.sar	107	120	0.2512E-01	0.3597E-02	18254
mansar1.xy324.sar	108	123	0.2556E-01	0.3646E-02	17696
mansar1.xy325.sar	108	132	0.2276E-01	0.3690E-02	17092
mansar1.xy326.sar	117	109	0.2249E-01	0.3734E-02	16494
mansar1.xy327.sar	117	112	0.2165E-01	0.3816E-02	15922
mansar1.xy328.sar	122	108	0.2059E-01	0.3888E-02	15262
mansar1.xy329.sar	122	111	0.2071E-01	0.3968E-02	14614
mansar1.xy330.sar	121	116	0.1965E-01	0.4047E-02	13936
mansar1.xy331.sar	120	122	0.1893E-01	0.4136E-02	13232
mansar1.xy332.sar	121	125	0.1866E-01	0.4247E-02	12560
mansar1.xy333.sar	122	132	0.1694E-01	0.4360E-02	11840
mansar1.xy334.sar	126	123	0.1641E-01	0.4493E-02	11140

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy335.sar	130	121	0.1580E-01	0.4645E-02	10348
mansar1.xy336.sar	132	123	0.1548E-01	0.4802E-02	9482
mansar1.xy337.sar	135	124	0.1533E-01	0.4968E-02	8586
mansar1.xy338.sar	137	128	0.1471E-01	0.5140E-02	7662
mansar1.xy339.sar	140	128	0.1361E-01	0.5314E-02	6710
mansar1.xy340.sar	146	126	0.1341E-01	0.5551E-02	5828
mansar1.xy341.sar	149	133	0.1293E-01	0.5783E-02	4770
mansar1.xy342.sar	155	132	0.1238E-01	0.6002E-02	3632
mansar1.xy343.sar	173	138	0.1363E-01	0.6275E-02	2554
mansar1.xy344.sar	171	140	0.8473E-02	0.5555E-02	710

Location and values for peak and average SAR for total volume of exposed tissue

mansar1.xy148.sar	81	109	0.1936E+00	0.4295E-02	7444294

Table 6.2. Slice and Whole Head Model Peak and average (averaged over slice) 1 Gram Average SAR for Kuster Head and Shoulders Model Exposed to AT&T RU Antenna with Nose in Contact with Radome 9 mm Below Middle of Patch Array and (slice file number is distance in mm from FDTD space rectangular coordinates origin in z direction).

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy11.1gsa	125	191	0.2355E-01	0.1906E-01	52
mansar1.xy12.1gsa	146	260	0.4668E-01	0.5950E-02	33632
mansar1.xy13.1gsa	147	260	0.4616E-01	0.5808E-02	33346
mansar1.xy14.1gsa	147	259	0.4586E-01	0.5488E-02	33090
mansar1.xy15.1gsa	148	257	0.4469E-01	0.5305E-02	32786
mansar1.xy16.1gsa	146	252	0.4436E-01	0.5057E-02	32492
mansar1.xy17.1gsa	147	251	0.4292E-01	0.4784E-02	32150
mansar1.xy18.1gsa	150	255	0.3867E-01	0.4487E-02	31818
mansar1.xy19.1gsa	150	252	0.3385E-01	0.4186E-02	31464
mansar1.xy20.1gsa	136	176	0.3493E-01	0.3888E-02	31096
mansar1.xy21.1gsa	136	176	0.3774E-01	0.3624E-02	30710
mansar1.xy22.1gsa	136	175	0.4082E-01	0.3418E-02	30352
mansar1.xy23.1gsa	135	175	0.4413E-01	0.3268E-02	29996
mansar1.xy24.1gsa	136	175	0.4698E-01	0.3160E-02	29646
mansar1.xy25.1gsa	137	176	0.4909E-01	0.3083E-02	29282
mansar1.xy26.1gsa	135	175	0.5095E-01	0.3051E-02	28940
mansar1.xy27.1gsa	136	175	0.5266E-01	0.3039E-02	28596
mansar1.xy28.1gsa	137	176	0.5342E-01	0.3040E-02	28262
mansar1.xy29.1gsa	137	175	0.5493E-01	0.3071E-02	27952
mansar1.xy30.1gsa	138	176	0.5492E-01	0.3102E-02	27624
mansar1.xy31.1gsa	139	176	0.5434E-01	0.3135E-02	27310
mansar1.xy32.1gsa	139	176	0.5473E-01	0.3175E-02	27000
mansar1.xy33.1gsa	139	176	0.5550E-01	0.3206E-02	26678
mansar1.xy34.1gsa	139	176	0.5811E-01	0.3213E-02	26348
mansar1.xy35.1gsa	140	177	0.5715E-01	0.3206E-02	26013
mansar1.xy36.1gsa	140	178	0.5984E-01	0.3206E-02	25669
mansar1.xy37.1gsa	140	178	0.6200E-01	0.3197E-02	25256
mansar1.xy38.1gsa	140	177	0.6326E-01	0.3181E-02	24854
mansar1.xy39.1gsa	141	179	0.6432E-01	0.3181E-02	24478
mansar1.xy40.1gsa	141	178	0.6634E-01	0.3189E-02	24094
mansar1.xy41.1gsa	141	179	0.6853E-01	0.3232E-02	23752
mansar1.xy42.1gsa	141	179	0.7050E-01	0.3281E-02	23406
mansar1.xy43.1gsa	141	179	0.7204E-01	0.3354E-02	23082
mansar1.xy44.1gsa	141	178	0.7291E-01	0.3411E-02	22732
mansar1.xy45.1gsa	141	177	0.7290E-01	0.3485E-02	22406
mansar1.xy46.1gsa	141	177	0.7338E-01	0.3554E-02	22080
mansar1.xy47.1gsa	142	180	0.7263E-01	0.3608E-02	21748
mansar1.xy48.1gsa	142	180	0.7293E-01	0.3673E-02	21410
mansar1.xy49.1gsa	142	179	0.7306E-01	0.3741E-02	21102
mansar1.xy50.1gsa	142	179	0.7268E-01	0.3782E-02	20778
mansar1.xy51.1gsa	142	179	0.7192E-01	0.3817E-02	20478
mansar1.xy52.1gsa	142	179	0.7065E-01	0.3852E-02	20158
mansar1.xy53.1gsa	142	180	0.6960E-01	0.3891E-02	19878
mansar1.xy54.1gsa	142	180	0.6873E-01	0.3960E-02	19610
mansar1.xy55.1gsa	142	180	0.6790E-01	0.3986E-02	19326
mansar1.xy56.1gsa	142	180	0.6689E-01	0.4010E-02	19028
mansar1.xy57.1gsa	142	179	0.6573E-01	0.4037E-02	18714
mansar1.xy58.1gsa	142	179	0.6457E-01	0.4049E-02	18404

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy59.1gsa	142	179	0.6333E-01	0.4090E-02	18106
mansar1.xy60.1gsa	141	178	0.6286E-01	0.4108E-02	17800
mansar1.xy61.1gsa	141	179	0.6258E-01	0.4211E-02	17550
mansar1.xy62.1gsa	141	179	0.6157E-01	0.4243E-02	17248
mansar1.xy63.1gsa	141	179	0.6042E-01	0.4340E-02	17038
mansar1.xy64.1gsa	141	180	0.5939E-01	0.4358E-02	16772
mansar1.xy65.1gsa	141	180	0.5796E-01	0.4361E-02	16498
mansar1.xy66.1gsa	140	178	0.5662E-01	0.4421E-02	16238
mansar1.xy67.1gsa	140	178	0.5592E-01	0.4422E-02	16000
mansar1.xy68.1gsa	140	178	0.5477E-01	0.4459E-02	15752
mansar1.xy69.1gsa	140	178	0.5347E-01	0.4477E-02	15516
mansar1.xy70.1gsa	140	179	0.5267E-01	0.4495E-02	15286
mansar1.xy71.1gsa	139	177	0.5196E-01	0.4492E-02	15060
mansar1.xy72.1gsa	139	177	0.5072E-01	0.4482E-02	14844
mansar1.xy73.1gsa	139	177	0.4954E-01	0.4467E-02	14638
mansar1.xy74.1gsa	139	178	0.4873E-01	0.4491E-02	14480
mansar1.xy75.1gsa	139	178	0.4758E-01	0.4480E-02	14262
mansar1.xy76.1gsa	139	177	0.4655E-01	0.4459E-02	14072
mansar1.xy77.1gsa	138	175	0.4570E-01	0.4475E-02	13874
mansar1.xy78.1gsa	135	168	0.4534E-01	0.4467E-02	13686
mansar1.xy79.1gsa	135	169	0.4507E-01	0.4458E-02	13518
mansar1.xy80.1gsa	134	165	0.4492E-01	0.4482E-02	13360
mansar1.xy81.1gsa	134	166	0.4490E-01	0.4473E-02	13194
mansar1.xy82.1gsa	134	167	0.4480E-01	0.4482E-02	13066
mansar1.xy83.1gsa	133	164	0.4502E-01	0.4463E-02	12916
mansar1.xy84.1gsa	133	165	0.4506E-01	0.4498E-02	12794
mansar1.xy85.1gsa	133	166	0.4500E-01	0.4504E-02	12670
mansar1.xy86.1gsa	133	167	0.4495E-01	0.4503E-02	12548
mansar1.xy87.1gsa	132	164	0.4556E-01	0.4509E-02	12442
mansar1.xy88.1gsa	132	165	0.4590E-01	0.4544E-02	12398
mansar1.xy89.1gsa	132	166	0.4604E-01	0.4570E-02	12340
mansar1.xy90.1gsa	131	163	0.4636E-01	0.4583E-02	12232
mansar1.xy91.1gsa	131	163	0.4647E-01	0.4576E-02	12166
mansar1.xy92.1gsa	131	164	0.4686E-01	0.4576E-02	12082
mansar1.xy93.1gsa	131	165	0.4712E-01	0.4604E-02	12050
mansar1.xy94.1gsa	130	162	0.4733E-01	0.4631E-02	12002
mansar1.xy95.1gsa	130	163	0.4790E-01	0.4642E-02	11938
mansar1.xy96.1gsa	130	164	0.4827E-01	0.4633E-02	11890
mansar1.xy97.1gsa	130	165	0.4842E-01	0.4675E-02	11850
mansar1.xy98.1gsa	130	166	0.4831E-01	0.4674E-02	11816
mansar1.xy99.1gsa	129	163	0.4849E-01	0.4662E-02	11784
mansar1.xy100.1gs	129	165	0.4900E-01	0.4667E-02	11746
mansar1.xy101.1gs	129	166	0.4903E-01	0.4683E-02	11734
mansar1.xy102.1gs	129	166	0.4851E-01	0.4659E-02	11724
mansar1.xy103.1gs	128	165	0.4914E-01	0.4628E-02	11713
mansar1.xy104.1gs	128	166	0.4857E-01	0.4640E-02	11712
mansar1.xy105.1gs	127	164	0.4806E-01	0.4598E-02	11708
mansar1.xy106.1gs	127	166	0.4785E-01	0.4559E-02	11706
mansar1.xy107.1gs	126	164	0.4682E-01	0.4559E-02	11730
mansar1.xy108.1gs	125	161	0.4626E-01	0.4555E-02	11746
mansar1.xy109.1gs	127	165	0.4510E-01	0.4557E-02	11774
mansar1.xy110.1gs	126	165	0.4424E-01	0.4551E-02	11824
mansar1.xy111.1gs	123	158	0.4280E-01	0.4558E-02	11854
mansar1.xy112.1gs	122	159	0.4088E-01	0.4777E-02	12002
mansar1.xy113.1gs	122	159	0.3902E-01	0.5284E-02	12306

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy114.1gs	121	159	0.3750E-01	0.5735E-02	12688
mansar1.xy115.1gs	121	159	0.3590E-01	0.6358E-02	13390
mansar1.xy116.1gs	76	146	0.4666E-01	0.6860E-02	13892
mansar1.xy117.1gs	74	145	0.4995E-01	0.7235E-02	14290
mansar1.xy118.1gs	74	142	0.5324E-01	0.7589E-02	14670
mansar1.xy119.1gs	75	139	0.5631E-01	0.7888E-02	14984
mansar1.xy120.1gs	74	139	0.5927E-01	0.8156E-02	15298
mansar1.xy121.1gs	74	137	0.6357E-01	0.8413E-02	15594
mansar1.xy122.1gs	79	131	0.6637E-01	0.8728E-02	15904
mansar1.xy123.1gs	79	130	0.6928E-01	0.8952E-02	16146
mansar1.xy124.1gs	82	125	0.7491E-01	0.9227E-02	16396
mansar1.xy125.1gs	82	123	0.8096E-01	0.9459E-02	16616
mansar1.xy126.1gs	81	123	0.8526E-01	0.9678E-02	16834
mansar1.xy127.1gs	81	122	0.8949E-01	0.9893E-02	17044
mansar1.xy128.1gs	80	122	0.9343E-01	0.1006E-01	17240
mansar1.xy129.1gs	79	122	0.9725E-01	0.1019E-01	17416
mansar1.xy130.1gs	82	119	0.1021E+00	0.1027E-01	17554
mansar1.xy131.1gs	82	118	0.1062E+00	0.1034E-01	17668
mansar1.xy132.1gs	82	118	0.1086E+00	0.1041E-01	17816
mansar1.xy133.1gs	81	118	0.1126E+00	0.1044E-01	17940
mansar1.xy134.1gs	81	118	0.1147E+00	0.1040E-01	18014
mansar1.xy135.1gs	81	117	0.1185E+00	0.1038E-01	18104
mansar1.xy136.1gs	81	116	0.1217E+00	0.1032E-01	18178
mansar1.xy137.1gs	81	116	0.1227E+00	0.1021E-01	18230
mansar1.xy138.1gs	81	115	0.1263E+00	0.1008E-01	18292
mansar1.xy139.1gs	81	115	0.1263E+00	0.9921E-02	18308
mansar1.xy140.1gs	81	114	0.1289E+00	0.9744E-02	18362
mansar1.xy141.1gs	81	114	0.1288E+00	0.9549E-02	18418
mansar1.xy142.1gs	81	113	0.1307E+00	0.9334E-02	18496
mansar1.xy143.1gs	81	113	0.1304E+00	0.9068E-02	18554
mansar1.xy144.1gs	81	112	0.1319E+00	0.8892E-02	18670
mansar1.xy145.1gs	81	112	0.1311E+00	0.8707E-02	18772
mansar1.xy146.1gs	80	112	0.1313E+00	0.8530E-02	18900
mansar1.xy147.1gs	81	111	0.1301E+00	0.8316E-02	19008
mansar1.xy148.1gs	80	111	0.1307E+00	0.8129E-02	19114
mansar1.xy149.1gs	80	111	0.1284E+00	0.7928E-02	19246
mansar1.xy150.1gs	81	109	0.1279E+00	0.7744E-02	19348
mansar1.xy151.1gs	80	110	0.1264E+00	0.7575E-02	19466
mansar1.xy152.1gs	81	108	0.1248E+00	0.7358E-02	19542
mansar1.xy153.1gs	80	109	0.1229E+00	0.7160E-02	19640
mansar1.xy154.1gs	81	108	0.1198E+00	0.6973E-02	19728
mansar1.xy155.1gs	80	108	0.1194E+00	0.6788E-02	19848
mansar1.xy156.1gs	80	108	0.1159E+00	0.6625E-02	19948
mansar1.xy157.1gs	80	108	0.1122E+00	0.6445E-02	20070
mansar1.xy158.1gs	79	108	0.1101E+00	0.6279E-02	20202
mansar1.xy159.1gs	79	108	0.1056E+00	0.6116E-02	20354
mansar1.xy160.1gs	80	107	0.1015E+00	0.5969E-02	20532
mansar1.xy161.1gs	80	107	0.9570E-01	0.5793E-02	20688
mansar1.xy162.1gs	81	107	0.9218E-01	0.5634E-02	20846
mansar1.xy163.1gs	79	107	0.8950E-01	0.5471E-02	21014
mansar1.xy164.1gs	79	107	0.8586E-01	0.5287E-02	21140
mansar1.xy165.1gs	79	107	0.8207E-01	0.5133E-02	21278
mansar1.xy166.1gs	82	105	0.7875E-01	0.4950E-02	21416
mansar1.xy167.1gs	82	105	0.7557E-01	0.4755E-02	21526
mansar1.xy168.1gs	80	201	0.7309E-01	0.4590E-02	21622

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mansar1.xy169.1gs	80	201	0.7065E-01	0.4431E-02	21752
mansar1.xy170.1gs	82	203	0.6983E-01	0.4289E-02	21874
mansar1.xy171.1gs	82	203	0.6798E-01	0.4144E-02	21974
mansar1.xy172.1gs	82	203	0.6598E-01	0.4021E-02	22128
mansar1.xy173.1gs	82	203	0.6404E-01	0.3872E-02	22250
mansar1.xy174.1gs	82	203	0.6202E-01	0.3723E-02	22348
mansar1.xy175.1gs	81	203	0.6111E-01	0.3599E-02	22478
mansar1.xy176.1gs	81	203	0.5912E-01	0.3496E-02	22614
mansar1.xy177.1gs	82	204	0.5739E-01	0.3397E-02	22734
mansar1.xy178.1gs	83	206	0.5621E-01	0.3303E-02	22896
mansar1.xy179.1gs	83	206	0.5507E-01	0.3221E-02	23052
mansar1.xy180.1gs	82	206	0.5368E-01	0.3161E-02	23180
mansar1.xy181.1gs	82	206	0.5213E-01	0.3090E-02	23344
mansar1.xy182.1gs	82	207	0.5130E-01	0.3050E-02	23514
mansar1.xy183.1gs	82	207	0.5019E-01	0.3016E-02	23664
mansar1.xy184.1gs	82	208	0.4935E-01	0.3001E-02	23822
mansar1.xy185.1gs	82	208	0.4815E-01	0.3000E-02	23984
mansar1.xy186.1gs	82	209	0.4742E-01	0.3027E-02	24186
mansar1.xy187.1gs	83	209	0.4661E-01	0.3080E-02	24428
mansar1.xy188.1gs	82	209	0.4586E-01	0.3147E-02	24658
mansar1.xy189.1gs	82	210	0.4560E-01	0.3218E-02	24918
mansar1.xy190.1gs	82	210	0.4495E-01	0.3249E-02	25100
mansar1.xy191.1gs	83	210	0.4426E-01	0.3264E-02	25236
mansar1.xy192.1gs	61	153	0.4450E-01	0.3277E-02	25422
mansar1.xy193.1gs	61	153	0.4623E-01	0.3289E-02	25534
mansar1.xy194.1gs	61	153	0.4727E-01	0.3311E-02	25692
mansar1.xy195.1gs	62	153	0.4827E-01	0.3322E-02	25808
mansar1.xy196.1gs	62	153	0.4926E-01	0.3347E-02	25944
mansar1.xy197.1gs	62	153	0.5030E-01	0.3353E-02	26062
mansar1.xy198.1gs	63	154	0.5168E-01	0.3366E-02	26194
mansar1.xy199.1gs	62	154	0.5339E-01	0.3387E-02	26294
mansar1.xy200.1gs	62	154	0.5564E-01	0.3403E-02	26438
mansar1.xy201.1gs	62	154	0.5805E-01	0.3402E-02	26526
mansar1.xy202.1gs	62	154	0.6088E-01	0.3386E-02	26628
mansar1.xy203.1gs	62	154	0.6420E-01	0.3402E-02	26750
mansar1.xy204.1gs	62	154	0.6748E-01	0.3397E-02	26816
mansar1.xy205.1gs	62	155	0.7116E-01	0.3391E-02	26930
mansar1.xy206.1gs	62	155	0.7496E-01	0.3409E-02	27006
mansar1.xy207.1gs	62	155	0.7830E-01	0.3386E-02	27078
mansar1.xy208.1gs	62	155	0.8131E-01	0.3363E-02	27160
mansar1.xy209.1gs	62	155	0.8385E-01	0.3329E-02	27202
mansar1.xy210.1gs	63	155	0.8625E-01	0.3291E-02	27260
mansar1.xy211.1gs	63	155	0.8831E-01	0.3253E-02	27310
mansar1.xy212.1gs	63	155	0.9015E-01	0.3227E-02	27350
mansar1.xy213.1gs	63	155	0.9182E-01	0.3169E-02	27404
mansar1.xy214.1gs	63	155	0.9299E-01	0.3137E-02	27442
mansar1.xy215.1gs	64	155	0.9384E-01	0.3110E-02	27496
mansar1.xy216.1gs	65	155	0.9399E-01	0.3075E-02	27550
mansar1.xy217.1gs	65	155	0.9411E-01	0.3047E-02	27602
mansar1.xy218.1gs	65	155	0.9422E-01	0.3008E-02	27652
mansar1.xy219.1gs	67	155	0.9443E-01	0.2984E-02	27702
mansar1.xy220.1gs	66	155	0.9507E-01	0.2959E-02	27764
mansar1.xy221.1gs	67	155	0.9555E-01	0.2943E-02	27824
mansar1.xy222.1gs	67	155	0.9604E-01	0.2919E-02	27888
mansar1.xy223.1gs	67	155	0.9596E-01	0.2899E-02	27930

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mansar1.xy224.1gs	67	155	0.9635E-01	0.2886E-02	28016
mansar1.xy225.1gs	69	155	0.9706E-01	0.2887E-02	28094
mansar1.xy226.1gs	69	155	0.9810E-01	0.2889E-02	28162
mansar1.xy227.1gs	69	155	0.9851E-01	0.2891E-02	28244
mansar1.xy228.1gs	68	155	0.9894E-01	0.2914E-02	28340
mansar1.xy229.1gs	69	155	0.9917E-01	0.2931E-02	28448
mansar1.xy230.1gs	70	155	0.9646E-01	0.2930E-02	28538
mansar1.xy231.1gs	70	155	0.9445E-01	0.2977E-02	28652
mansar1.xy232.1gs	70	156	0.9130E-01	0.2996E-02	28736
mansar1.xy233.1gs	71	156	0.8767E-01	0.3042E-02	28878
mansar1.xy234.1gs	71	156	0.8320E-01	0.3077E-02	28988
mansar1.xy235.1gs	83	95	0.7920E-01	0.3132E-02	29122
mansar1.xy236.1gs	82	96	0.8089E-01	0.3179E-02	29262
mansar1.xy237.1gs	81	96	0.8256E-01	0.3246E-02	29406
mansar1.xy238.1gs	81	97	0.8468E-01	0.3302E-02	29540
mansar1.xy239.1gs	79	97	0.8719E-01	0.3373E-02	29702
mansar1.xy240.1gs	79	97	0.8917E-01	0.3450E-02	29864
mansar1.xy241.1gs	80	96	0.9092E-01	0.3534E-02	30012
mansar1.xy242.1gs	79	97	0.9287E-01	0.3646E-02	30184
mansar1.xy243.1gs	79	97	0.9412E-01	0.3723E-02	30324
mansar1.xy244.1gs	79	97	0.9512E-01	0.3833E-02	30510
mansar1.xy245.1gs	79	96	0.9647E-01	0.3923E-02	30644
mansar1.xy246.1gs	78	97	0.9753E-01	0.4015E-02	30808
mansar1.xy247.1gs	78	97	0.9758E-01	0.4071E-02	30912
mansar1.xy248.1gs	77	98	0.9801E-01	0.4104E-02	30994
mansar1.xy249.1gs	77	98	0.9831E-01	0.4134E-02	31060
mansar1.xy250.1gs	76	99	0.9759E-01	0.4135E-02	31112
mansar1.xy251.1gs	77	99	0.9700E-01	0.4130E-02	31172
mansar1.xy252.1gs	77	99	0.9724E-01	0.4125E-02	31220
mansar1.xy253.1gs	76	100	0.9748E-01	0.4109E-02	31252
mansar1.xy254.1gs	76	100	0.9811E-01	0.4072E-02	31278
mansar1.xy255.1gs	76	101	0.9773E-01	0.4046E-02	31310
mansar1.xy256.1gs	77	100	0.9810E-01	0.4016E-02	31328
mansar1.xy257.1gs	75	102	0.9917E-01	0.3971E-02	31340
mansar1.xy258.1gs	76	102	0.9936E-01	0.3912E-02	31344
mansar1.xy259.1gs	76	102	0.9955E-01	0.3841E-02	31348
mansar1.xy260.1gs	76	103	0.9840E-01	0.3793E-02	31364
mansar1.xy261.1gs	76	103	0.9819E-01	0.3739E-02	31374
mansar1.xy262.1gs	77	102	0.9769E-01	0.3708E-02	31370
mansar1.xy263.1gs	77	103	0.9644E-01	0.3694E-02	31372
mansar1.xy264.1gs	78	101	0.9647E-01	0.3685E-02	31372
mansar1.xy265.1gs	79	99	0.9691E-01	0.3699E-02	31372
mansar1.xy266.1gs	79	99	0.9763E-01	0.3713E-02	31349
mansar1.xy267.1gs	79	100	0.9653E-01	0.3707E-02	31324
mansar1.xy268.1gs	78	102	0.9678E-01	0.3737E-02	31302
mansar1.xy269.1gs	79	100	0.9784E-01	0.3781E-02	31276
mansar1.xy270.1gs	79	101	0.9753E-01	0.3823E-02	31244
mansar1.xy271.1gs	79	101	0.9854E-01	0.3862E-02	31212
mansar1.xy272.1gs	79	101	0.9905E-01	0.3928E-02	31187
mansar1.xy273.1gs	79	101	0.9950E-01	0.3985E-02	31157
mansar1.xy274.1gs	79	101	0.9980E-01	0.4060E-02	31120
mansar1.xy275.1gs	79	101	0.9939E-01	0.4122E-02	31088
mansar1.xy276.1gs	79	102	0.9826E-01	0.4173E-02	31048
mansar1.xy277.1gs	79	102	0.9730E-01	0.4225E-02	31000
mansar1.xy278.1gs	79	102	0.9604E-01	0.4253E-02	30930

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mansar1.xy279.1gs	79	103	0.9451E-01	0.4298E-02	30884
mansar1.xy280.1gs	79	102	0.9345E-01	0.4335E-02	30806
mansar1.xy281.1gs	78	105	0.9208E-01	0.4347E-02	30728
mansar1.xy282.1gs	79	103	0.9058E-01	0.4357E-02	30664
mansar1.xy283.1gs	79	104	0.8893E-01	0.4359E-02	30580
mansar1.xy284.1gs	78	106	0.8714E-01	0.4365E-02	30468
mansar1.xy285.1gs	79	105	0.8530E-01	0.4338E-02	30378
mansar1.xy286.1gs	79	105	0.8375E-01	0.4319E-02	30292
mansar1.xy287.1gs	78	107	0.8168E-01	0.4305E-02	30170
mansar1.xy288.1gs	79	106	0.7950E-01	0.4258E-02	30054
mansar1.xy289.1gs	79	107	0.7732E-01	0.4223E-02	29946
mansar1.xy290.1gs	79	107	0.7549E-01	0.4187E-02	29786
mansar1.xy291.1gs	79	108	0.7308E-01	0.4129E-02	29648
mansar1.xy292.1gs	80	107	0.7077E-01	0.4082E-02	29490
mansar1.xy293.1gs	79	109	0.6872E-01	0.4022E-02	29316
mansar1.xy294.1gs	80	109	0.6590E-01	0.3974E-02	29148
mansar1.xy295.1gs	81	108	0.6375E-01	0.3908E-02	28950
mansar1.xy296.1gs	81	109	0.6141E-01	0.3864E-02	28756
mansar1.xy297.1gs	82	109	0.5863E-01	0.3804E-02	28530
mansar1.xy298.1gs	82	110	0.5629E-01	0.3744E-02	28282
mansar1.xy299.1gs	83	110	0.5353E-01	0.3694E-02	28078
mansar1.xy300.1gs	83	112	0.5119E-01	0.3644E-02	27840
mansar1.xy301.1gs	84	112	0.4853E-01	0.3624E-02	27650
mansar1.xy302.1gs	85	112	0.4619E-01	0.3561E-02	27346
mansar1.xy303.1gs	86	112	0.4389E-01	0.3532E-02	27056
mansar1.xy304.1gs	87	112	0.4150E-01	0.3506E-02	26710
mansar1.xy305.1gs	88	112	0.3939E-01	0.3478E-02	26366
mansar1.xy306.1gs	88	114	0.3724E-01	0.3455E-02	26008
mansar1.xy307.1gs	89	114	0.3555E-01	0.3425E-02	25634
mansar1.xy308.1gs	91	113	0.3344E-01	0.3397E-02	25254
mansar1.xy309.1gs	91	115	0.3174E-01	0.3372E-02	24840
mansar1.xy310.1gs	94	111	0.3047E-01	0.3359E-02	24428
mansar1.xy311.1gs	94	113	0.2928E-01	0.3345E-02	24006
mansar1.xy312.1gs	95	113	0.2810E-01	0.3337E-02	23596
mansar1.xy313.1gs	97	112	0.2666E-01	0.3339E-02	23182
mansar1.xy314.1gs	98	112	0.2555E-01	0.3339E-02	22718
mansar1.xy315.1gs	99	113	0.2424E-01	0.3354E-02	22268
mansar1.xy316.1gs	102	197	0.2340E-01	0.3375E-02	21842
mansar1.xy317.1gs	104	198	0.2266E-01	0.3387E-02	21362
mansar1.xy318.1gs	105	197	0.2164E-01	0.3401E-02	20854
mansar1.xy319.1gs	104	114	0.2080E-01	0.3421E-02	20358
mansar1.xy320.1gs	109	200	0.2006E-01	0.3442E-02	19812
mansar1.xy321.1gs	109	198	0.1937E-01	0.3476E-02	19306
mansar1.xy322.1gs	109	197	0.1899E-01	0.3514E-02	18796
mansar1.xy323.1gs	112	199	0.1789E-01	0.3561E-02	18254
mansar1.xy324.1gs	113	198	0.1712E-01	0.3597E-02	17696
mansar1.xy325.1gs	113	195	0.1619E-01	0.3644E-02	17092
mansar1.xy326.1gs	116	197	0.1553E-01	0.3704E-02	16494
mansar1.xy327.1gs	118	197	0.1487E-01	0.3779E-02	15922
mansar1.xy328.1gs	119	196	0.1434E-01	0.3842E-02	15262
mansar1.xy329.1gs	119	114	0.1372E-01	0.3910E-02	14614
mansar1.xy330.1gs	117	122	0.1317E-01	0.3982E-02	13936
mansar1.xy331.1gs	119	122	0.1270E-01	0.4072E-02	13232
mansar1.xy332.1gs	120	125	0.1202E-01	0.4174E-02	12560
mansar1.xy333.1gs	123	123	0.1149E-01	0.4276E-02	11840

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
mansar1.xy334.1gs	124	125	0.1109E-01	0.4396E-02	11140
mansar1.xy335.1gs	127	124	0.1051E-01	0.4526E-02	10348
mansar1.xy336.1gs	129	126	0.9884E-02	0.4662E-02	9482
mansar1.xy337.1gs	133	124	0.9465E-02	0.4804E-02	8586
mansar1.xy338.1gs	135	128	0.9091E-02	0.4948E-02	7662
mansar1.xy339.1gs	139	125	0.8742E-02	0.5087E-02	6710
mansar1.xy340.1gs	141	129	0.8414E-02	0.5192E-02	5828
mansar1.xy341.1gs	147	127	0.8032E-02	0.5286E-02	4770
mansar1.xy342.1gs	151	131	0.7640E-02	0.5359E-02	3632
mansar1.xy343.1gs	157	131	0.7252E-02	0.5449E-02	2554
mansar1.xy344.1gs	164	172	0.6800E-02	0.5610E-02	710

Location and values for peak and average 1 gram average SAR for total volume of exposed tissue

mansar1.xy144.1gs	81	112	0.1319E+00	0.4319E-02	744429

Figure 3.4 illustrates the orientation of the Kuster head model with respect to the antenna in the sagittal or xz plane at y = 154 mm from the origin of the rectangular coordinate system at the lower-front-left corner of the fdtd mesh. The horizontal black lines, A through K denotes the horizontal xy planes where the SAR data was plotted and printed. However, SAR data were calculated for all of the 333, 1-mm thick horizontal xy slices as well as for the vertical slices denoted by L through N in the sagittal xz plane of the simulated head tissue illustrated in Figure 3.5.

Figure 6.1 illustrates the FDTD derived SAR distribution in xz planes through the head corresponding to the vertical slices K (through the center of the left row of antenna patches), L (through the center of the array of patches) and M (through the right row of patches) defined in Figure 3.5. The SAR distributions as averaged over each 1 mm cubical cell or voxel, calculated by the FDTD program are depicted as a color graphs with each color representing a 6 dB range of SAR values. The maximum SAR corresponding to the 0-dB reference is shown below each graph. Note that the SAR in the in the center of the head model drops to levels lower than -30 decibels with respect to the maximum of 0.172 W/kg at or near the facial surface of the model.

Figures 6.2 and 6.3 respectively illustrate the SAR distribution in the horizontal xy planes at slices labeled as A through E and F through K as denoted in Figure 3.4. As for the previous figure each color representing the SAR distribution as averaged over each 1-mm cubical cell corresponds to a 6-dB range of SAR values. The maximum SAR corresponding to 0 dB is listed below each graph in the figure. The peak SAR for the entire head model, 0.194 W/kg occurs at the location of the black plus sign in the scan through the slice denoted as E in Figure 6.2.

Figures 6.4 and 6.5 illustrate the respective color plots of the SAR distribution in the xy planes denoted by A through E and F through K as identified in Figure 3.4. The legend for these plots is set for the color red to represent all SARs at or greater than the value 1.6 W/kg allowed by the FCC MPL. The maximum value of the SAR for each plot is shown in the text below the plots. The maximum 1-gram average for the entire head model, 0.132 W/kg occurs at the location of the black plus sign in slice D of Figure 6.4.

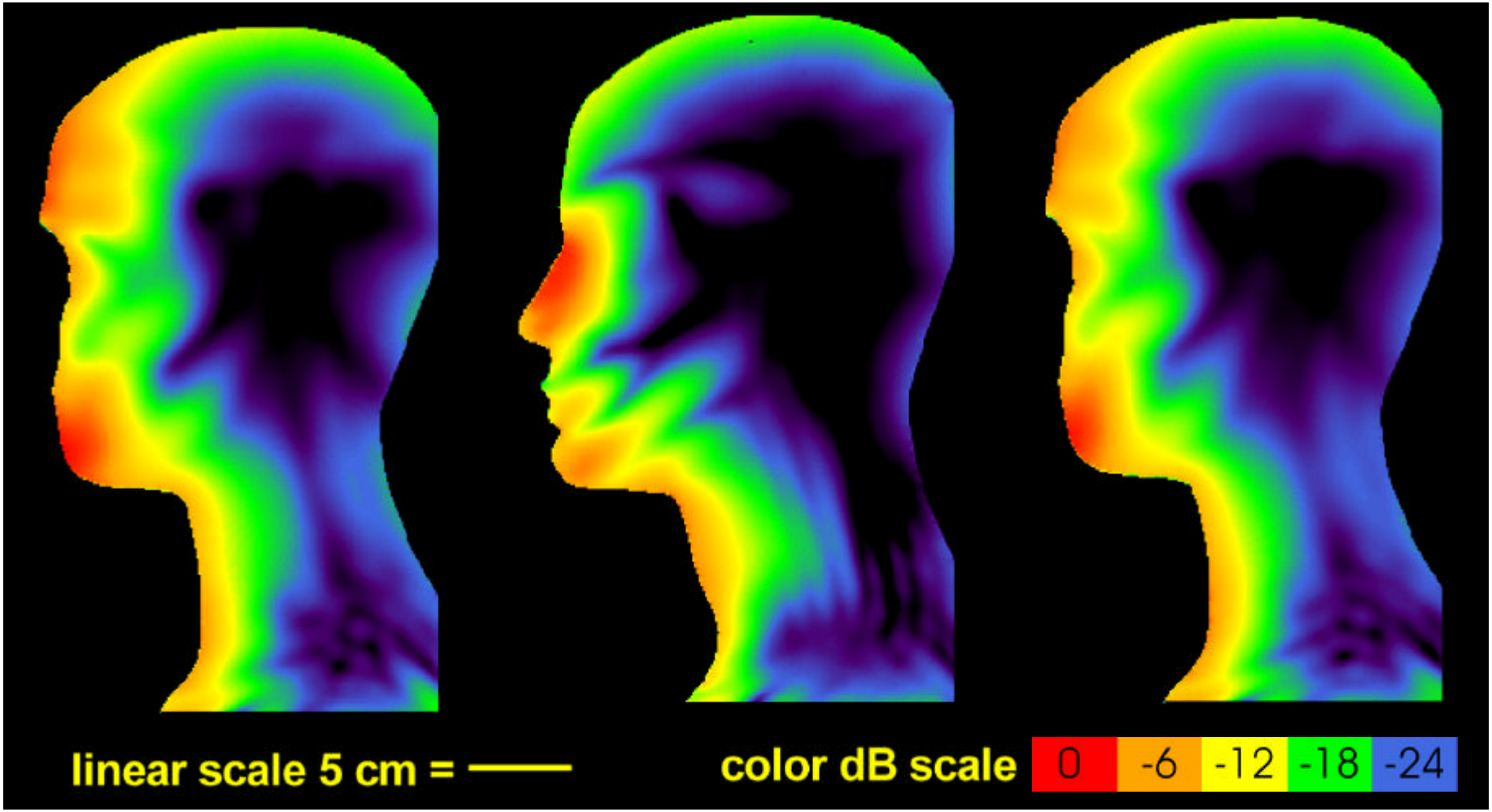
It is difficult to make an accurate plot by plot comparison of the FDTD derived SAR and the corresponding measurements made by SPEAG as discussed in Appendix A because (a) the latter were based on a medium with a 8 % higher conductivity of 1.83 S/m rather than the desired target value of 1.69 S/m, which as explained in the appendix was the lowest achievable with the water/sugar composition at 1.92 GHz and (b) the 2-dimensional plots of the measured SARs for the latter were done in planes parallel to the ground plane rather than in the two orthogonal planes perpendicular to the ground plane as obtained from the

calculations. Restrictions on computer memory prohibited detailed calculations to be made in all planes using a single computer run so to save time the two orientations that produced the most informative color plots given in the preceding figures were chosen. To avoid a long computer run to obtain data for 2-dimensional plots in the yz-planes parallel to the antenna ground plane, a program was written to sort some of the calculated data from the xy planes to make a plot of the maximum calculated SAR occurring in planes parallel to the antenna ground plane for comparison with the measured maxima in those planes.

Figure 6.6 illustrates a comparison between the FDTD maximum derived values of peak (blue curve) and 1 gram average SAR (green curve) in each yz plane slice of the Kuster head model and the measured values by SPEAG (red deltas for peak) and SARTest (orange delta for peak and orange diamond for 1-gram average) versus distance x from the ground plane. The SPEAG measurements are discussed in page 29 to 32 and in Sub-Appendix H of Appendix A and the SARTest measurements are tabulated in Table 1 of Appendix C. The peak value of 0.17 W/kg measured by SARTest is close but lower than the calculated value of 0.194 W/kg. The 1-gram average of 0.09 W/kg obtained by SARTest is somewhat lower than the maximum calculated 1-gram average SAR of 0.13 W/kg. However when SARTest measured the SARs for an exposed inhomogeneous model with a layer of skin the obtained respective peak and 1-gram average values of 0.2 and 0.17 W/kg as indicated in Table 2 of Appendix C. Appendix C provides all details on the methodology used for making the measurements. The SPEAG measured peak values fall well below the calculated peak values. This may be due in part to the fact that the calculations are based on a net power of 79.62 mW delivered to the antenna while the measurements are based on an incident power of 80.0 mW to the antenna which can result in a lower net power because of the amount of reflected power from the surface of the model. The calculations must be based on “worst case” conditions where lacking any information on how well the antenna remains tuned when close to the exposed subject, it is assumed that all of the available power is delivered to the antenna. As stated in page 24 of Appendix A, due to the irregular shape of the model the measurements could not be made at all locations within the simulated tissue especially close to boundaries. There appears to be a more likely reason that the measured maximum SARs fall below the calculated maximum SARs at the cross-sectional planes further from the source. As seen from the color graphs at these locations the SARs tend to be higher at the boundaries of the planes due to defracted energy or surface wave propagation around the surface of the model a region that is not accessible by the measurement probe. The measurements indicated that the highest SAR of 0.0637 W/kg (14 dB below the FCC MPL) occurred in the lower left side of the face in front of the patch with the highest radiation. The highest radiation from the FDTD model of the antenna came from the lower right patch which produced the maximum SAR of 0.194 W/kg (9 dB below the FCC MPL) at the right side of the face. It should be noted, however the FCC MPL is based on the maximum 1 gram average SAR which was found to be 0.132 W/kg (10.8 dB below the MPL) by the calculations and 0.09 W/kg (0.17

W/kg or 9.7 dB below the MPL in the skin clad phantom head) by the SARTest measurements. SPEAG indicated that the maximum 1-gram average measurement could not be made in the phantom because of the irregular boundaries of the simulated tissue.

SPEAG made measurements of the peak SAR along a line perpendicular to the antenna through the nose of the model as a function of distance from the ground plane shown in Figure 3.9 of Appendix A. Data from the FDTD calculations showing peak and 1 gram average SAR along the same line were plotted with the measured data as shown in Figure 6.7. For this case the measured peak values followed nearly the same pattern but with a maximum value (0.081 W/kg) higher than the calculated peak value (0.0535 W/kg) and the 1-gram average value (0.0448 W/kg).

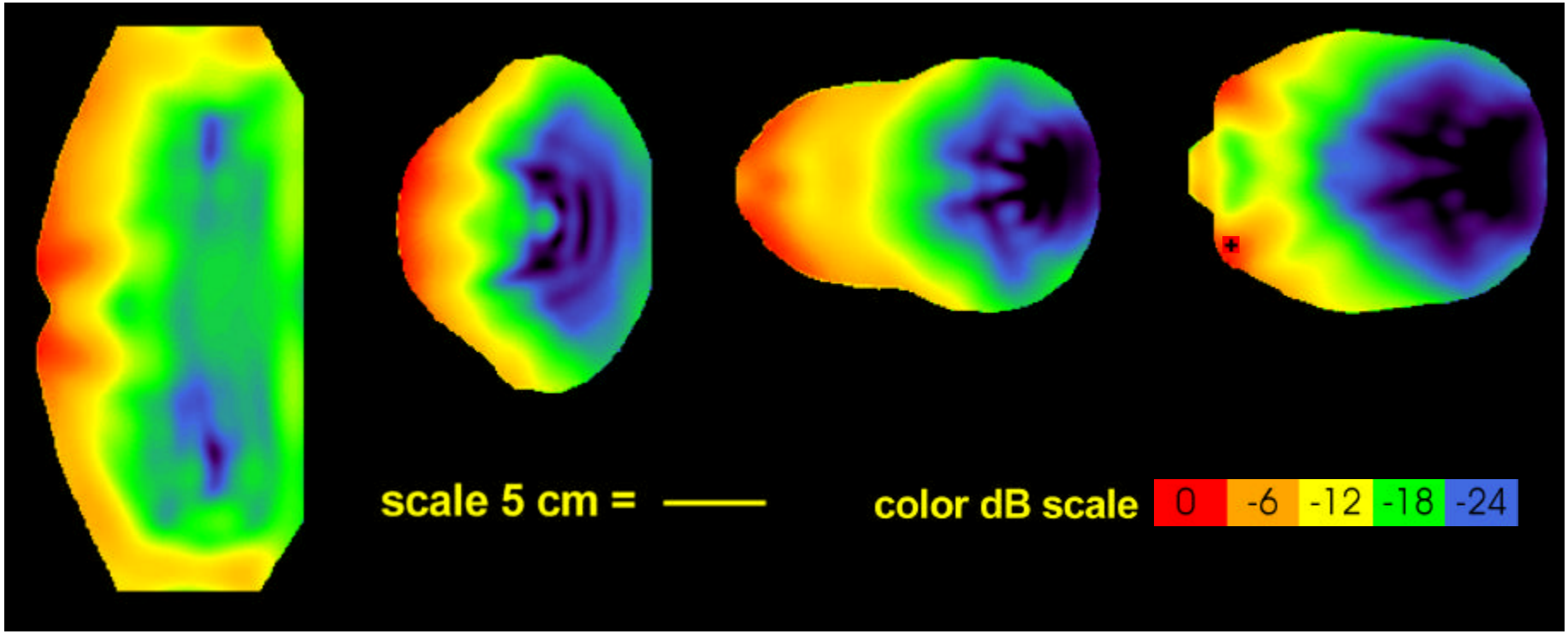


scan K, slice 118
0 dB = 0.152 W/kg

scan L, slice 154
0 dB = 0.172 W/kg

scan M, slice 191
0 dB = 0.163 W/kg

Figure 6.1. FDTD derived x-z plane SAR distributions in Kuster model head exposed to AT&T RU antenna.



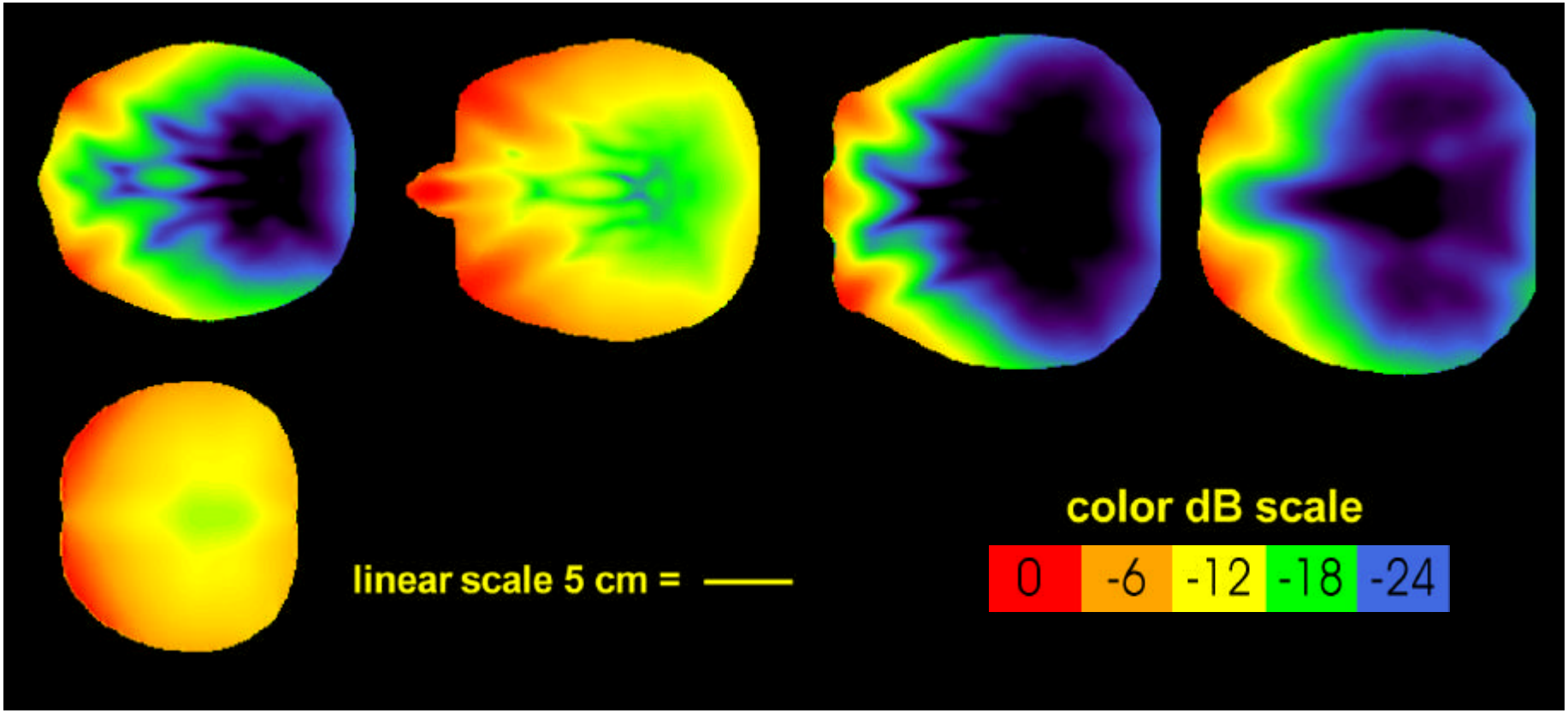
scan A, slice 20
0 dB = 0.0507 W/kg

scan B, slice 70
0 dB = 0.064 W/kg

scan C, slice 126
0 dB = 0.120 W/kg

scan E, slice 148
0 dB = 0.194 W/kg

Figure 6.2. FDTD derived x-y plane SAR distributions in Kuster model head exposed to AT&T RU antenna (black plus sign in scan E indicates location of maximum SAR for whole head).



scan F, slice 175
0 dB = 0.0926 W/kg

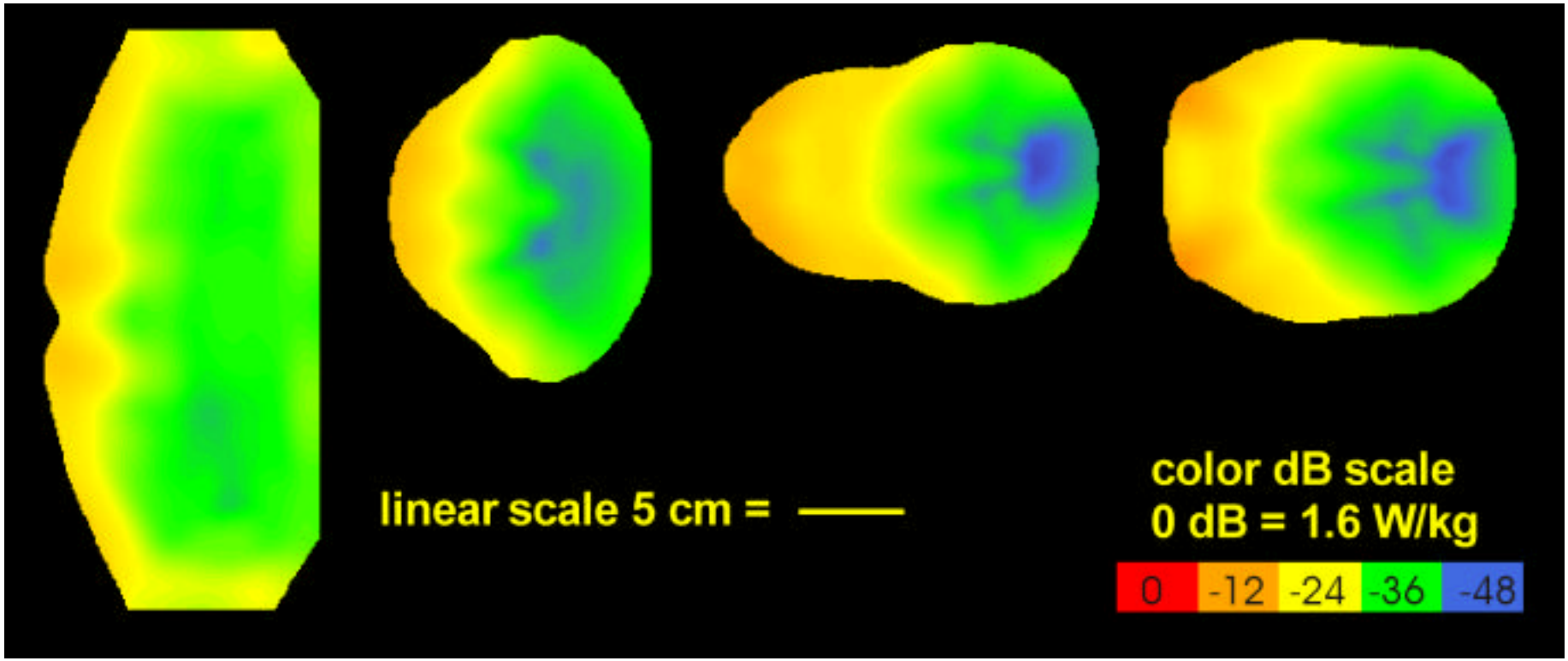
scan G, slice 193
0 dB = 0.0643 W/kg

scan I, slice 240
0 dB = 0.121 W/kg

scan J, slice 278
0 dB = 0.141 W/k

scan K, slice 325
0 dB = 0.0229 W/kg

Figure 6.3. FDTD derived x-y plane SAR distributions in Kuster model head exposed to AT&T RU antenna.



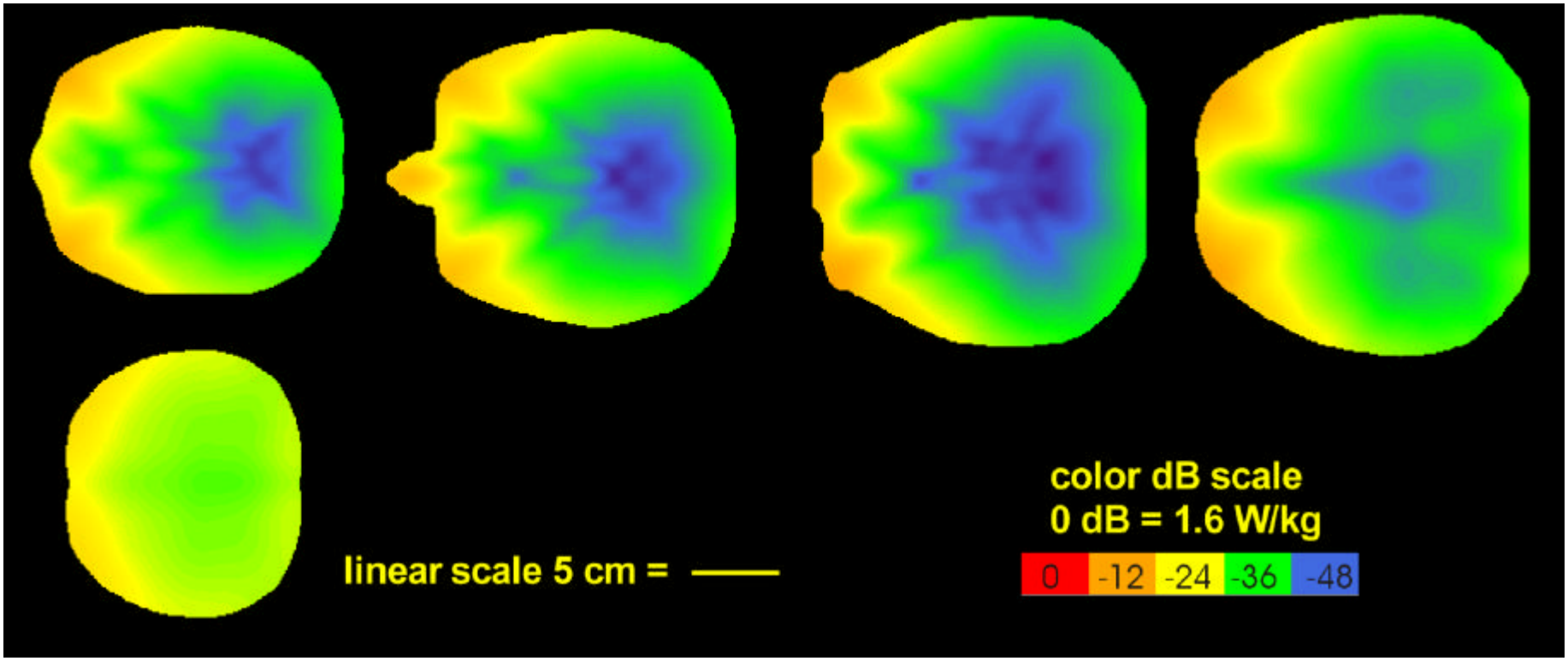
scan A, slice 20
Max = 0.0356

scan B, slice 70
Max = 0.0536

scan C, slice 126
Max = 0.0868

scan D, slice 144
Max = 0.134

Figure 6.4. FDTD derived x-y plane 1 gram average SAR (W/kg) distributions in Kuster model head exposed to AT&T RU antenna compared to maximum allowed by ANSI/IEEE standard.



scan F, slice 175
Max = 0.0622

scan G, slice 193
Max = 0.0471

scan I, slice 240
Max = 0.0908

scan J, slice 278
Max = 0.0978

scan K, slice 325
Max = 0.0165

Figure 6.5. FDTD derived x-y plane 1 gram average SAR (W/kg) distributions in Kuster model head exposed to AT&T RU antenna compared to ANSI/IEEE standard.

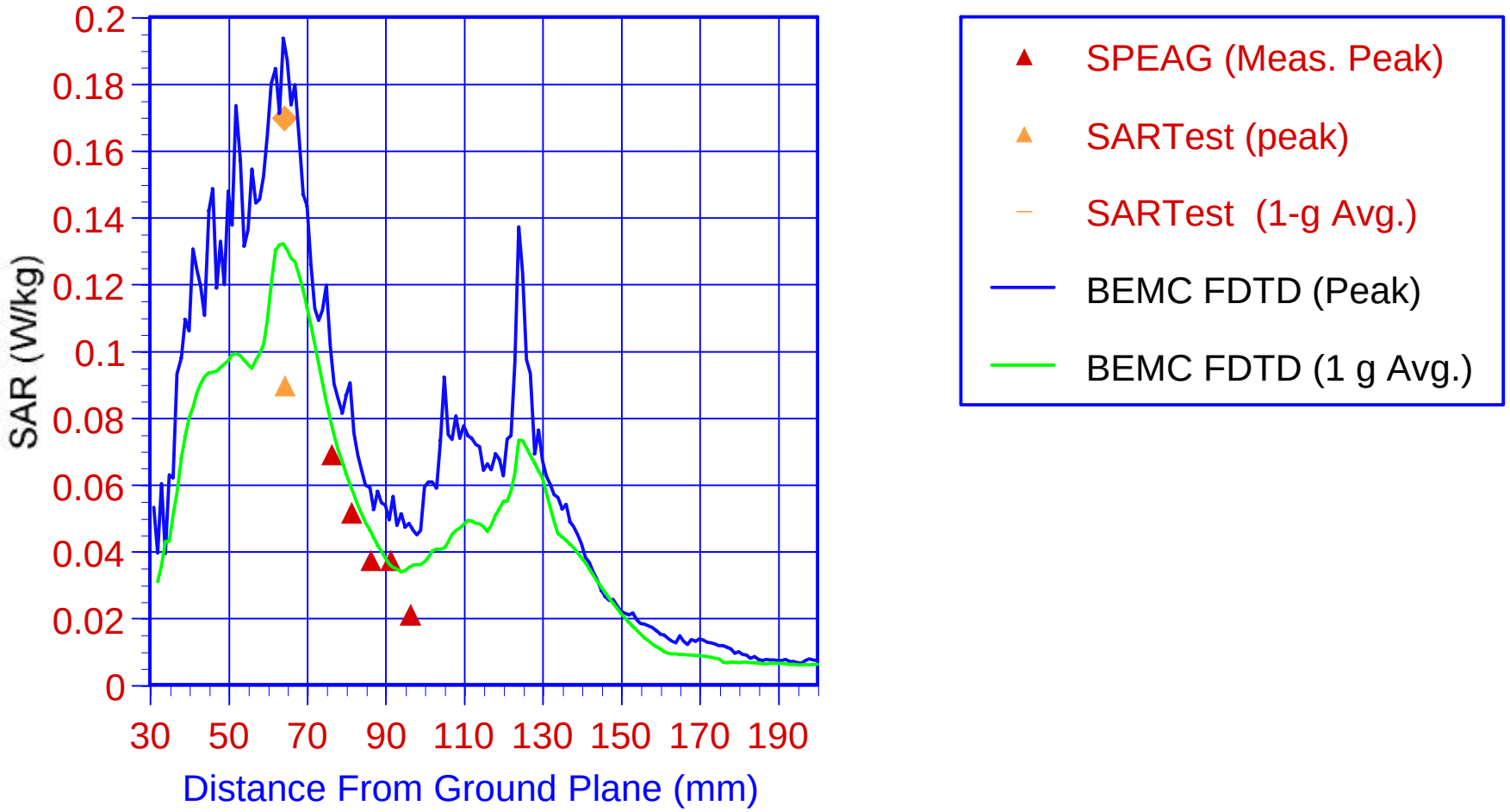


Figure 6.6. Comparison of FDTD maximum derived values of peak and 1 gram average SAR by BEMC in each yz plane slice of the Kuster head model as a function of and measured values by SPEAG and SARTest versus distance x from ground plane with face of Kuster phantom head model exposed to AT&T RU antenna with tip of nose in contact with radome (31 cm from ground plane) and 9 mm below center of patch array (SARTest peak SAR of 0,09 W/kg was highest measured at accessable locations but unreported value obtained from extrapolation to phantom boundary of 0.26 W/kg was used to obtain 1-gram average of 0.17 W/kg).

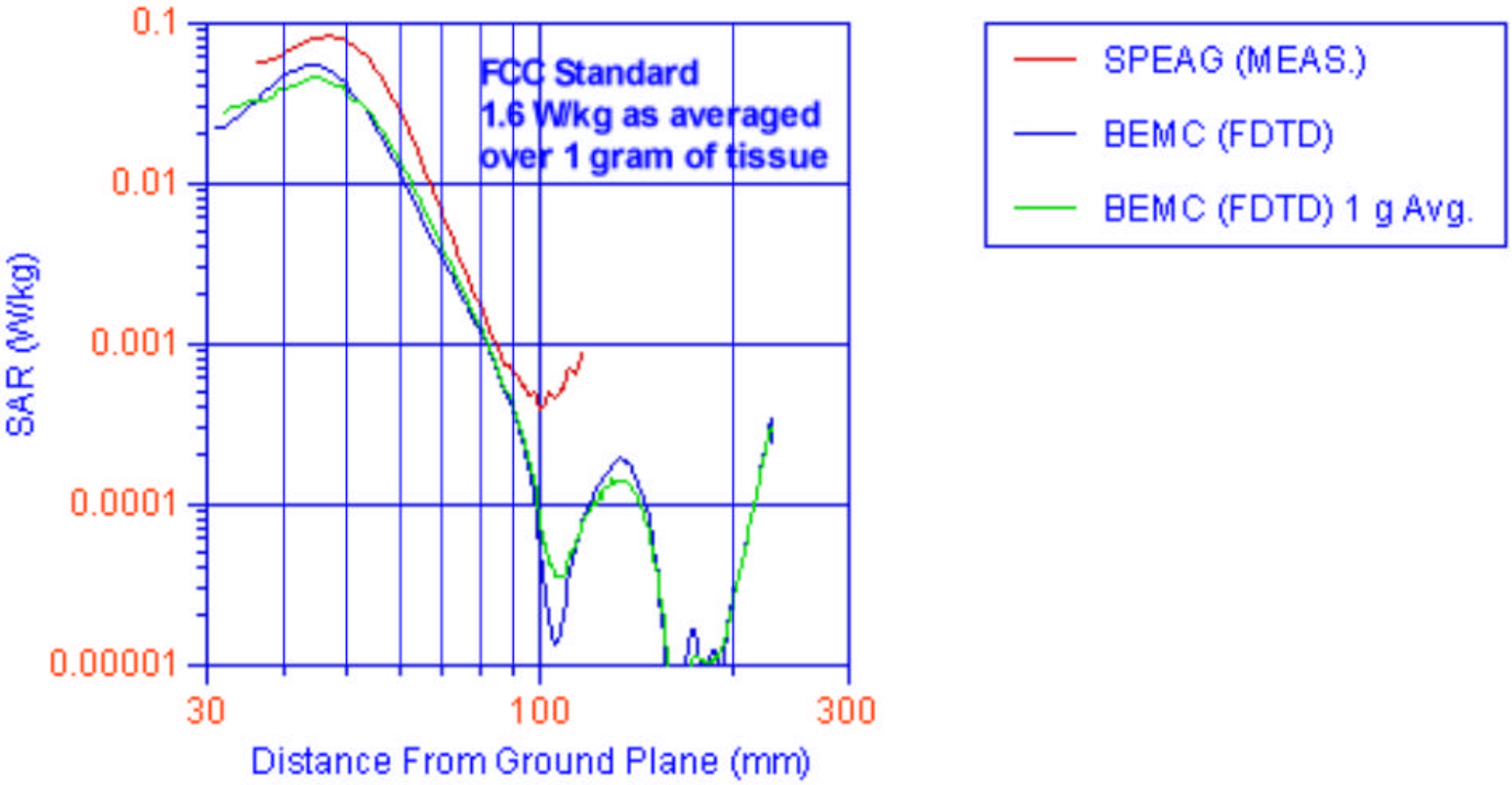


Figure 6.7. Comparison of FDTD derived values of SAR by BEMCand measured values by SPEAG with face of Kuster phantom head model exposed to AT&T RU antenna with tip of nose in contact with radome (31 cm from ground plane) and 9 mm below center of patch array (values plotted along line through tip of nose and perpendicular to ground plane.

6.2 Orientation with Tip of Nose in Contact with Radome and Centered over Lower Right Patch

The near field calculations and measurements indicated that the fields were highest in front of the patch radiators in the antenna array. In fact the calculated fields were found to be the highest in front of the lower right patch. In order to evaluate the worst case conditions FDTD calculations were made of the peak and 1-gram average of the SARs in the Kuster homogeneous head model when exposed to the AT&T RU antenna with the tip of the nose in contact with the radome and centered over the lower right patch as illustrated in Figures 3.6 and 3.7. The results were compared to the measurements made by SPEAG described in Appendix A. The highest fields for the antenna used to perform the measurements occurred in front of the lower left patch so the measurements were done with the nose of the model oriented over that patch.

Table 6.3 summarizes the calculated results of both the peak and average SARs calculated for each 1-mm thick slice in the xy plane as well as for the entire exposed head model. The format of the table is the same as previously discussed for Table 6.1. It may be noted from the table that the maximum SAR of 3.49 W/kg for the entire head model is in the 63rd slice (file mansar1.yz63.sar) at y=225 mm and z=115 mm and the average SAR for the 886 cells of that slice is 0.583 W/kg. It can also be seen at the bottom of the table that the SAR as averaged over the 5611108 cells of the entire head model is 0.00665 W/kg.

Table 6.4 illustrates the results of the 1-gram averaging of the fdtd output data. The format is the same as discussed for Table 6.2. It may be noted from the table that the highest 1-g average SAR of 1.53 W/kg occurs in the slice at x=60 mm at the position y=226 mm and z=117 mm. This is only 0.223 dB below the FCC MPL of 1.6 W/kg. However, it must be noted that with the intended 2 watt e.i.r.p. operation of the antenna, the SAR would actually be 1.6 dB below the FCC MPL if exposure continued at this level as averaged over any 30-minute period. Furthermore it is unlikely that a subject would hold his or her nose against the radome for such an extended period. Even for exposures in this position for up to a minute, the time averaged SAR would be no greater than -16 dB below the FCC MPL. Assuming an average head tissue density the same as water, the total mass of the phantom head tissue is 5611108/1,000,000 = 5.61 kg. Using the average SAR of 0.00665 from Table 6.3 the total absorbed power is 0.00665x5.61= 0.0373 W = 37.3 mW which is 46.85 % of the antenna input power. For the worst case of all of the 79.62 mW of radiated power absorbed by a 70-Kg man the whole-body average SAR would be 0.001377 W/kg. Thus we may conclude that under these exposure conditions the whole-body averaged SAR for an adult man with a head similar to that of the Kuster phantom head would be somewhere between 0.001377 and 0.00665 W/kg or from 12 to 58 times less than that allowed by the FCC MPL of 0.08 W/kg.

Table 6.3 Slice and Whole Head Model Peak and average SAR (averaged over slice) for Kuster Head and Shoulders Model Exposed to AT&T RU Antenna with Nose in Contact with Radome and centered over lower left patch (slice file number is distance in mm from FDTD space rectangular coordinates origin in x direction).

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz49.sar	225	126	0.9698E+00	0.6452E+00	36
kuster3.yz50.sar	225	128	0.1709E+01	0.8013E+00	70
kuster3.yz51.sar	227	130	0.2083E+01	0.9135E+00	110
kuster3.yz52.sar	228	133	0.1687E+01	0.9645E+00	134
kuster3.yz53.sar	227	133	0.2761E+01	0.1041E+01	164
kuster3.yz54.sar	224	133	0.2211E+01	0.1065E+01	200
kuster3.yz55.sar	227	136	0.2355E+01	0.1068E+01	238
kuster3.yz56.sar	229	136	0.2094E+01	0.1057E+01	278
kuster3.yz57.sar	226	118	0.3082E+01	0.1062E+01	312
kuster3.yz58.sar	226	118	0.2384E+01	0.1014E+01	356
kuster3.yz59.sar	225	117	0.3117E+01	0.1000E+01	390
kuster3.yz60.sar	225	118	0.2685E+01	0.8896E+00	472
kuster3.yz61.sar	226	116	0.2934E+01	0.7885E+00	562
kuster3.yz62.sar	225	117	0.2616E+01	0.6989E+00	678
kuster3.yz63.sar	225	115	0.3485E+01	0.5830E+00	886
kuster3.yz64.sar	226	114	0.2930E+01	0.4717E+00	1368
kuster3.yz65.sar	226	114	0.1705E+01	0.3807E+00	1830
kuster3.yz66.sar	226	122	0.1308E+01	0.2907E+00	2492
kuster3.yz67.sar	226	124	0.1218E+01	0.2281E+00	3214
kuster3.yz68.sar	226	125	0.1139E+01	0.1822E+00	4038
kuster3.yz69.sar	226	126	0.1057E+01	0.1484E+00	4992
kuster3.yz70.sar	226	126	0.9770E+00	0.1242E+00	5910
kuster3.yz71.sar	226	126	0.8943E+00	0.1072E+00	6874
kuster3.yz72.sar	226	126	0.8118E+00	0.9066E-01	7822
kuster3.yz73.sar	226	127	0.7335E+00	0.7745E-01	8706
kuster3.yz74.sar	226	127	0.6587E+00	0.6696E-01	9592
kuster3.yz75.sar	226	127	0.5882E+00	0.5823E-01	10542
kuster3.yz76.sar	226	127	0.5229E+00	0.5085E-01	11814
kuster3.yz77.sar	226	127	0.4631E+00	0.4603E-01	13084
kuster3.yz78.sar	226	128	0.4096E+00	0.4143E-01	14116
kuster3.yz79.sar	226	128	0.3621E+00	0.3737E-01	15686
kuster3.yz80.sar	226	128	0.3195E+00	0.3393E-01	16408
kuster3.yz81.sar	226	128	0.2815E+00	0.3154E-01	17276
kuster3.yz82.sar	226	128	0.2476E+00	0.2952E-01	18136
kuster3.yz83.sar	226	128	0.2175E+00	0.2734E-01	18814
kuster3.yz84.sar	226	128	0.1906E+00	0.2527E-01	19366
kuster3.yz85.sar	226	128	0.1667E+00	0.2339E-01	19950
kuster3.yz86.sar	226	128	0.1455E+00	0.2173E-01	20386
kuster3.yz87.sar	226	129	0.1267E+00	0.2023E-01	20738
kuster3.yz88.sar	226	129	0.1101E+00	0.1884E-01	21072
kuster3.yz89.sar	226	129	0.9557E-01	0.1757E-01	21398
kuster3.yz90.sar	226	129	0.8287E-01	0.1642E-01	21720
kuster3.yz91.sar	226	129	0.7185E-01	0.1536E-01	21992
kuster3.yz92.sar	165	159	0.7209E-01	0.1442E-01	22286
kuster3.yz93.sar	185	240	0.7560E-01	0.1356E-01	22578
kuster3.yz94.sar	182	239	0.8330E-01	0.1289E-01	23200
kuster3.yz95.sar	184	240	0.6241E-01	0.1211E-01	23456
kuster3.yz96.sar	181	241	0.7021E-01	0.1145E-01	23744
kuster3.yz97.sar	181	242	0.7207E-01	0.1088E-01	24068

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz98.sar	167	231	0.8040E-01	0.1032E-01	24349
kuster3.yz99.sar	168	233	0.7429E-01	0.9833E-02	24639
kuster3.yz100.sar	169	235	0.7135E-01	0.9403E-02	24908
kuster3.yz101.sar	166	233	0.8173E-01	0.9001E-02	25195
kuster3.yz102.sar	178	243	0.7824E-01	0.8622E-02	25456
kuster3.yz103.sar	169	238	0.7071E-01	0.8303E-02	25717
kuster3.yz104.sar	166	236	0.8258E-01	0.8016E-02	25980
kuster3.yz105.sar	174	243	0.8057E-01	0.7742E-02	26190
kuster3.yz106.sar	167	239	0.7896E-01	0.7524E-02	26419
kuster3.yz107.sar	165	238	0.7773E-01	0.7351E-02	26659
kuster3.yz108.sar	186	252	0.8372E-01	0.7182E-02	26869
kuster3.yz109.sar	172	245	0.9009E-01	0.7192E-02	27330
kuster3.yz110.sar	168	244	0.7193E-01	0.6991E-02	27527
kuster3.yz111.sar	167	244	0.7859E-01	0.6852E-02	27777
kuster3.yz112.sar	165	243	0.8113E-01	0.6702E-02	27954
kuster3.yz113.sar	176	251	0.9073E-01	0.6556E-02	28163
kuster3.yz114.sar	168	247	0.8064E-01	0.6413E-02	28330
kuster3.yz115.sar	172	250	0.8276E-01	0.6283E-02	28536
kuster3.yz116.sar	169	249	0.8907E-01	0.6140E-02	28709
kuster3.yz117.sar	167	248	0.8711E-01	0.6003E-02	28885
kuster3.yz118.sar	166	248	0.8805E-01	0.5870E-02	29045
kuster3.yz119.sar	169	251	0.8615E-01	0.5732E-02	29233
kuster3.yz120.sar	167	250	0.9815E-01	0.5610E-02	29399
kuster3.yz121.sar	166	250	0.8573E-01	0.5524E-02	29590
kuster3.yz122.sar	165	250	0.8756E-01	0.5414E-02	29730
kuster3.yz123.sar	168	253	0.8393E-01	0.5346E-02	29935
kuster3.yz124.sar	153	239	0.8321E-01	0.5328E-02	30287
kuster3.yz125.sar	173	257	0.7464E-01	0.5202E-02	30477
kuster3.yz126.sar	168	255	0.7374E-01	0.5115E-02	30667
kuster3.yz127.sar	161	249	0.8288E-01	0.5021E-02	30886
kuster3.yz128.sar	167	255	0.7633E-01	0.4929E-02	31143
kuster3.yz129.sar	166	255	0.7452E-01	0.4852E-02	31407
kuster3.yz130.sar	159	249	0.7641E-01	0.4759E-02	31705
kuster3.yz131.sar	152	242	0.8295E-01	0.4678E-02	32035
kuster3.yz132.sar	158	249	0.7941E-01	0.4593E-02	32359
kuster3.yz133.sar	168	258	0.7648E-01	0.4532E-02	32710
kuster3.yz134.sar	166	257	0.7792E-01	0.4448E-02	33005
kuster3.yz135.sar	155	248	0.7520E-01	0.4384E-02	33294
kuster3.yz136.sar	166	258	0.7195E-01	0.4315E-02	33515
kuster3.yz137.sar	165	258	0.7483E-01	0.4251E-02	33744
kuster3.yz138.sar	168	260	0.7154E-01	0.4211E-02	33984
kuster3.yz139.sar	152	247	0.8512E-01	0.4204E-02	34355
kuster3.yz140.sar	151	247	0.7233E-01	0.4136E-02	34555
kuster3.yz141.sar	166	260	0.6954E-01	0.4059E-02	34738
kuster3.yz142.sar	165	260	0.7031E-01	0.4002E-02	34917
kuster3.yz143.sar	150	247	0.6507E-01	0.3939E-02	35081
kuster3.yz144.sar	166	261	0.6810E-01	0.3871E-02	35240
kuster3.yz145.sar	165	261	0.6960E-01	0.3801E-02	35417
kuster3.yz146.sar	167	262	0.6651E-01	0.3728E-02	35572
kuster3.yz147.sar	166	262	0.6592E-01	0.3651E-02	35708
kuster3.yz148.sar	170	264	0.6212E-01	0.3578E-02	35844
kuster3.yz149.sar	165	262	0.6610E-01	0.3521E-02	35988
kuster3.yz150.sar	155	255	0.5999E-01	0.3452E-02	36145
kuster3.yz151.sar	150	251	0.6259E-01	0.3378E-02	36283
kuster3.yz152.sar	157	257	0.6199E-01	0.3308E-02	36402

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz153.sar	170	265	0.6198E-01	0.3251E-02	36523
kuster3.yz154.sar	145	245	0.6126E-01	0.3209E-02	36732
kuster3.yz155.sar	152	254	0.5801E-01	0.3137E-02	36847
kuster3.yz156.sar	166	264	0.5733E-01	0.3071E-02	36967
kuster3.yz157.sar	150	253	0.5723E-01	0.3004E-02	37066
kuster3.yz158.sar	151	254	0.5411E-01	0.2942E-02	37173
kuster3.yz159.sar	164	263	0.5585E-01	0.2882E-02	37273
kuster3.yz160.sar	162	262	0.5481E-01	0.2817E-02	37352
kuster3.yz161.sar	167	265	0.5532E-01	0.2756E-02	37435
kuster3.yz162.sar	150	254	0.5690E-01	0.2697E-02	37529
kuster3.yz163.sar	158	260	0.5388E-01	0.2639E-02	37595
kuster3.yz164.sar	155	258	0.5707E-01	0.2584E-02	37698
kuster3.yz165.sar	152	256	0.5412E-01	0.2530E-02	37773
kuster3.yz166.sar	159	261	0.5134E-01	0.2479E-02	37856
kuster3.yz167.sar	153	257	0.5416E-01	0.2425E-02	37925
kuster3.yz168.sar	170	267	0.5321E-01	0.2373E-02	37981
kuster3.yz169.sar	170	267	0.5127E-01	0.2332E-02	38076
kuster3.yz170.sar	165	265	0.4616E-01	0.2279E-02	38108
kuster3.yz171.sar	166	266	0.4276E-01	0.2235E-02	38151
kuster3.yz172.sar	165	265	0.5465E-01	0.2193E-02	38165
kuster3.yz173.sar	165	265	0.5330E-01	0.2148E-02	38190
kuster3.yz174.sar	162	263	0.5419E-01	0.2109E-02	38232
kuster3.yz175.sar	162	263	0.4902E-01	0.2066E-02	38244
kuster3.yz176.sar	155	259	0.4585E-01	0.2024E-02	38275
kuster3.yz177.sar	155	259	0.4815E-01	0.1986E-02	38309
kuster3.yz178.sar	158	261	0.4705E-01	0.1946E-02	38322
kuster3.yz179.sar	168	267	0.4345E-01	0.1912E-02	38354
kuster3.yz180.sar	167	266	0.5307E-01	0.1881E-02	38382
kuster3.yz181.sar	167	266	0.4713E-01	0.1849E-02	38385
kuster3.yz182.sar	165	266	0.3957E-01	0.1818E-02	38394
kuster3.yz183.sar	165	266	0.3900E-01	0.1791E-02	38422
kuster3.yz184.sar	165	266	0.3860E-01	0.1766E-02	38425
kuster3.yz185.sar	165	266	0.3819E-01	0.1742E-02	38431
kuster3.yz186.sar	165	266	0.3768E-01	0.1716E-02	38417
kuster3.yz187.sar	165	266	0.3694E-01	0.1691E-02	38419
kuster3.yz188.sar	178	270	0.3578E-01	0.1667E-02	38419
kuster3.yz189.sar	161	10	0.3696E-01	0.1644E-02	38390
kuster3.yz190.sar	158	261	0.3811E-01	0.1622E-02	38392
kuster3.yz191.sar	167	266	0.4019E-01	0.1600E-02	38372
kuster3.yz192.sar	165	265	0.4239E-01	0.1575E-02	38348
kuster3.yz193.sar	158	10	0.4249E-01	0.1551E-02	38292
kuster3.yz194.sar	150	255	0.3482E-01	0.1528E-02	38224
kuster3.yz195.sar	157	260	0.3551E-01	0.1503E-02	38167
kuster3.yz196.sar	168	266	0.3573E-01	0.1477E-02	38115
kuster3.yz197.sar	153	257	0.3745E-01	0.1453E-02	38040
kuster3.yz198.sar	158	10	0.4454E-01	0.1433E-02	37970
kuster3.yz199.sar	157	10	0.4289E-01	0.1413E-02	37917
kuster3.yz200.sar	165	264	0.3783E-01	0.1401E-02	37690
kuster3.yz201.sar	168	265	0.3556E-01	0.1381E-02	37607
kuster3.yz202.sar	156	258	0.3662E-01	0.1367E-02	37544
kuster3.yz203.sar	157	10	0.4379E-01	0.1354E-02	37459
kuster3.yz204.sar	156	10	0.4007E-01	0.1340E-02	37297
kuster3.yz205.sar	165	263	0.3521E-01	0.1332E-02	37204
kuster3.yz206.sar	156	257	0.3480E-01	0.1325E-02	37086
kuster3.yz207.sar	156	10	0.4695E-01	0.1318E-02	36982

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz208.sar	155	10	0.4025E-01	0.1313E-02	36867
kuster3.yz209.sar	157	11	0.3797E-01	0.1309E-02	36700
kuster3.yz210.sar	168	263	0.3181E-01	0.1309E-02	36563
kuster3.yz211.sar	166	262	0.3218E-01	0.1306E-02	36420
kuster3.yz212.sar	164	260	0.3186E-01	0.1304E-02	36273
kuster3.yz213.sar	163	259	0.2848E-01	0.1302E-02	36115
kuster3.yz214.sar	176	265	0.2991E-01	0.1301E-02	35921
kuster3.yz215.sar	174	264	0.3320E-01	0.1307E-02	35566
kuster3.yz216.sar	168	261	0.3356E-01	0.1309E-02	35349
kuster3.yz217.sar	171	262	0.3333E-01	0.1317E-02	35144
kuster3.yz218.sar	159	12	0.3146E-01	0.1320E-02	34936
kuster3.yz219.sar	157	10	0.3194E-01	0.1326E-02	34691
kuster3.yz220.sar	161	255	0.2958E-01	0.1328E-02	34472
kuster3.yz221.sar	168	259	0.3229E-01	0.1335E-02	34206
kuster3.yz222.sar	169	259	0.2881E-01	0.1338E-02	33917
kuster3.yz223.sar	163	14	0.3029E-01	0.1335E-02	33651
kuster3.yz224.sar	159	10	0.2866E-01	0.1334E-02	33359
kuster3.yz225.sar	170	258	0.2744E-01	0.1331E-02	33052
kuster3.yz226.sar	160	10	0.2904E-01	0.1323E-02	32736
kuster3.yz227.sar	161	10	0.3160E-01	0.1320E-02	32368
kuster3.yz228.sar	179	260	0.2608E-01	0.1309E-02	31983
kuster3.yz229.sar	163	10	0.2535E-01	0.1309E-02	31556
kuster3.yz230.sar	163	10	0.3202E-01	0.1310E-02	30650
kuster3.yz231.sar	169	253	0.3050E-01	0.1307E-02	30129
kuster3.yz232.sar	185	259	0.2797E-01	0.1307E-02	29605
kuster3.yz233.sar	181	257	0.2751E-01	0.1315E-02	29036
kuster3.yz234.sar	165	10	0.2945E-01	0.1324E-02	28414
kuster3.yz235.sar	165	10	0.2862E-01	0.1338E-02	27783
kuster3.yz236.sar	173	251	0.2615E-01	0.1357E-02	27011
kuster3.yz237.sar	181	254	0.2516E-01	0.1379E-02	26189
kuster3.yz238.sar	187	255	0.2271E-01	0.1404E-02	24998
kuster3.yz239.sar	179	251	0.2553E-01	0.1426E-02	24003
kuster3.yz240.sar	183	252	0.2340E-01	0.1449E-02	23067
kuster3.yz241.sar	171	10	0.2014E-01	0.1465E-02	22154
kuster3.yz242.sar	185	251	0.2071E-01	0.1477E-02	21293
kuster3.yz243.sar	173	10	0.2268E-01	0.1485E-02	20442
kuster3.yz244.sar	175	10	0.2028E-01	0.1511E-02	19598
kuster3.yz245.sar	191	249	0.1952E-01	0.1478E-02	18008
kuster3.yz246.sar	187	247	0.1797E-01	0.1473E-02	17216
kuster3.yz247.sar	180	10	0.2114E-01	0.1474E-02	16441
kuster3.yz248.sar	182	10	0.1689E-01	0.1478E-02	15660
kuster3.yz249.sar	184	10	0.1667E-01	0.1481E-02	14860
kuster3.yz250.sar	186	10	0.1625E-01	0.1483E-02	14056
kuster3.yz251.sar	188	10	0.1646E-01	0.1490E-02	13294
kuster3.yz252.sar	190	10	0.1542E-01	0.1499E-02	12518
kuster3.yz253.sar	193	10	0.1398E-01	0.1513E-02	11764
kuster3.yz254.sar	195	10	0.1438E-01	0.1537E-02	10998
kuster3.yz255.sar	197	10	0.1500E-01	0.1569E-02	10214
kuster3.yz256.sar	200	10	0.1407E-01	0.1610E-02	9464
kuster3.yz257.sar	203	10	0.1271E-01	0.1666E-02	8714
kuster3.yz258.sar	207	10	0.9944E-02	0.1735E-02	7970
kuster3.yz259.sar	232	12	0.5783E-02	0.1782E-02	7232
Location and values for peak and average SAR for total volume of exposed tissue					
kuster3.yz63.sar	**225**	**115**	**0.3485E+01**	**0.6650E-02**	**5611108**

Table 6.4. Slice and Whole Head Model Peak and average (averaged over slice) 1 Gram Average SAR for Kuster Head and Shoulders Model Exposed to AT&T RU Antenna with Nose in Contact with Radome and centered over lower right patch (slice file number is distance in mm from FDTD space rectangular coordinates origin in x direction).

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz49.1gsa	228	129	0.1063E+01	0.9486E+00	36
kuster3.yz50.1gsa	228	131	0.1195E+01	0.9794E+00	70
kuster3.yz51.1gsa	228	134	0.1354E+01	0.1020E+01	110
kuster3.yz52.1gsa	228	134	0.1354E+01	0.1042E+01	134
kuster3.yz53.1gsa	229	135	0.1409E+01	0.1062E+01	164
kuster3.yz54.1gsa	227	134	0.1412E+01	0.1077E+01	200
kuster3.yz55.1gsa	229	135	0.1412E+01	0.1090E+01	238
kuster3.yz56.1gsa	229	135	0.1405E+01	0.1085E+01	278
kuster3.yz57.1gsa	228	135	0.1384E+01	0.1076E+01	312
kuster3.yz58.1gsa	226	118	0.1380E+01	0.1035E+01	356
kuster3.yz59.1gsa	227	118	0.1470E+01	0.9968E+00	390
kuster3.yz60.1gsa	226	117	0.1532E+01	0.8931E+00	472
kuster3.yz61.1gsa	225	118	0.1506E+01	0.7907E+00	562
kuster3.yz62.1gsa	226	118	0.1428E+01	0.6904E+00	678
kuster3.yz63.1gsa	227	120	0.1333E+01	0.5643E+00	886
kuster3.yz64.1gsa	227	120	0.1246E+01	0.4461E+00	1368
kuster3.yz65.1gsa	227	121	0.1160E+01	0.3557E+00	1830
kuster3.yz66.1gsa	227	121	0.1066E+01	0.2741E+00	2492
kuster3.yz67.1gsa	227	123	0.9773E+00	0.2171E+00	3214
kuster3.yz68.1gsa	227	126	0.9015E+00	0.1759E+00	4038
kuster3.yz69.1gsa	227	126	0.8311E+00	0.1432E+00	4992
kuster3.yz70.1gsa	227	127	0.7634E+00	0.1203E+00	5910
kuster3.yz71.1gsa	227	127	0.6970E+00	0.1024E+00	6874
kuster3.yz72.1gsa	227	128	0.6343E+00	0.8683E-01	7822
kuster3.yz73.1gsa	227	128	0.5631E+00	0.7478E-01	8706
kuster3.yz74.1gsa	227	128	0.5168E+00	0.6529E-01	9592
kuster3.yz75.1gsa	227	128	0.4560E+00	0.5665E-01	10542
kuster3.yz76.1gsa	228	129	0.4141E+00	0.4976E-01	11814
kuster3.yz77.1gsa	227	128	0.3631E+00	0.4442E-01	13084
kuster3.yz78.1gsa	228	129	0.3282E+00	0.4018E-01	14116
kuster3.yz79.1gsa	228	129	0.2910E+00	0.3639E-01	15686
kuster3.yz80.1gsa	228	129	0.2575E+00	0.3343E-01	16408
kuster3.yz81.1gsa	228	130	0.2275E+00	0.3103E-01	17276
kuster3.yz82.1gsa	227	129	0.1980E+00	0.2870E-01	18136
kuster3.yz83.1gsa	227	129	0.1745E+00	0.2663E-01	18814
kuster3.yz84.1gsa	227	129	0.1536E+00	0.2465E-01	19366
kuster3.yz85.1gsa	227	129	0.1349E+00	0.2292E-01	19950
kuster3.yz86.1gsa	227	129	0.1183E+00	0.2132E-01	20386
kuster3.yz87.1gsa	227	129	0.1036E+00	0.1986E-01	20738
kuster3.yz88.1gsa	227	129	0.9063E-01	0.1852E-01	21072
kuster3.yz89.1gsa	228	130	0.8033E-01	0.1728E-01	21398
kuster3.yz90.1gsa	228	130	0.7007E-01	0.1619E-01	21720
kuster3.yz91.1gsa	228	130	0.6108E-01	0.1514E-01	21992
kuster3.yz92.1gsa	228	130	0.5323E-01	0.1422E-01	22286
kuster3.yz93.1gsa	186	242	0.5195E-01	0.1333E-01	22578
kuster3.yz94.1gsa	185	243	0.5205E-01	0.1264E-01	23200
kuster3.yz95.1gsa	185	244	0.5213E-01	0.1193E-01	23456
kuster3.yz96.1gsa	185	244	0.5229E-01	0.1125E-01	23744
kuster3.yz97.1gsa	184	245	0.5219E-01	0.1069E-01	24068
kuster3.yz98.1gsa	186	246	0.5209E-01	0.1015E-01	24349

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz99.1gsa	181	245	0.5189E-01	0.9649E-02	24639
kuster3.yz100.1gs	181	246	0.5231E-01	0.9220E-02	24908
kuster3.yz101.1gs	183	247	0.5251E-01	0.8852E-02	25195
kuster3.yz102.1gs	169	239	0.5284E-01	0.8473E-02	25456
kuster3.yz103.1gs	173	243	0.5375E-01	0.8174E-02	25717
kuster3.yz104.1gs	172	243	0.5453E-01	0.7887E-02	25980
kuster3.yz105.1gs	171	243	0.5491E-01	0.7622E-02	26190
kuster3.yz106.1gs	171	244	0.5525E-01	0.7408E-02	26419
kuster3.yz107.1gs	170	244	0.5546E-01	0.7195E-02	26659
kuster3.yz108.1gs	170	245	0.5565E-01	0.7019E-02	26869
kuster3.yz109.1gs	169	245	0.5575E-01	0.6989E-02	27330
kuster3.yz110.1gs	170	247	0.5579E-01	0.6840E-02	27527
kuster3.yz111.1gs	169	247	0.5583E-01	0.6688E-02	27777
kuster3.yz112.1gs	169	248	0.5612E-01	0.6525E-02	27954
kuster3.yz113.1gs	170	249	0.5630E-01	0.6394E-02	28163
kuster3.yz114.1gs	170	250	0.5636E-01	0.6244E-02	28330
kuster3.yz115.1gs	169	250	0.5641E-01	0.6119E-02	28536
kuster3.yz116.1gs	170	251	0.5637E-01	0.5980E-02	28709
kuster3.yz117.1gs	170	252	0.5665E-01	0.5850E-02	28885
kuster3.yz118.1gs	169	252	0.5693E-01	0.5724E-02	29045
kuster3.yz119.1gs	170	253	0.5682E-01	0.5620E-02	29233
kuster3.yz120.1gs	168	253	0.5693E-01	0.5497E-02	29399
kuster3.yz121.1gs	169	254	0.5651E-01	0.5394E-02	29590
kuster3.yz122.1gs	168	254	0.5603E-01	0.5269E-02	29730
kuster3.yz123.1gs	169	255	0.5541E-01	0.5180E-02	29935
kuster3.yz124.1gs	169	256	0.5513E-01	0.5176E-02	30287
kuster3.yz125.1gs	168	256	0.5459E-01	0.5061E-02	30477
kuster3.yz126.1gs	170	257	0.5407E-01	0.4981E-02	30667
kuster3.yz127.1gs	169	257	0.5376E-01	0.4876E-02	30886
kuster3.yz128.1gs	171	259	0.5348E-01	0.4796E-02	31143
kuster3.yz129.1gs	170	259	0.5302E-01	0.4697E-02	31407
kuster3.yz130.1gs	168	258	0.5260E-01	0.4624E-02	31705
kuster3.yz131.1gs	171	260	0.5204E-01	0.4563E-02	32035
kuster3.yz132.1gs	170	260	0.5221E-01	0.4459E-02	32359
kuster3.yz133.1gs	169	260	0.5210E-01	0.4408E-02	32710
kuster3.yz134.1gs	168	260	0.5170E-01	0.4344E-02	33005
kuster3.yz135.1gs	169	261	0.5113E-01	0.4270E-02	33294
kuster3.yz136.1gs	169	261	0.5045E-01	0.4196E-02	33515
kuster3.yz137.1gs	168	261	0.5005E-01	0.4127E-02	33744
kuster3.yz138.1gs	169	262	0.4962E-01	0.4083E-02	33984
kuster3.yz139.1gs	168	262	0.4923E-01	0.4095E-02	34355
kuster3.yz140.1gs	169	263	0.4880E-01	0.4016E-02	34555
kuster3.yz141.1gs	169	263	0.4776E-01	0.3947E-02	34738
kuster3.yz142.1gs	166	262	0.4743E-01	0.3893E-02	34917
kuster3.yz143.1gs	168	263	0.4654E-01	0.3827E-02	35081
kuster3.yz144.1gs	167	263	0.4621E-01	0.3742E-02	35240
kuster3.yz145.1gs	166	263	0.4593E-01	0.3683E-02	35417
kuster3.yz146.1gs	168	264	0.4533E-01	0.3609E-02	35572
kuster3.yz147.1gs	167	264	0.4512E-01	0.3546E-02	35708
kuster3.yz148.1gs	167	264	0.4463E-01	0.3475E-02	35844
kuster3.yz149.1gs	166	264	0.4419E-01	0.3414E-02	35988
kuster3.yz150.1gs	168	265	0.4342E-01	0.3352E-02	36145
kuster3.yz151.1gs	167	265	0.4317E-01	0.3280E-02	36283
kuster3.yz152.1gs	157	258	0.4261E-01	0.3208E-02	36402
kuster3.yz153.1gs	155	257	0.4214E-01	0.3139E-02	36523
kuster3.yz154.1gs	156	258	0.4202E-01	0.3107E-02	36732
kuster3.yz155.1gs	154	257	0.4137E-01	0.3033E-02	36847

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz156.1gs	167	266	0.4107E-01	0.2976E-02	36967
kuster3.yz157.1gs	167	266	0.4056E-01	0.2917E-02	37066
kuster3.yz158.1gs	167	266	0.3996E-01	0.2852E-02	37173
kuster3.yz159.1gs	167	266	0.3951E-01	0.2790E-02	37273
kuster3.yz160.1gs	166	266	0.3948E-01	0.2725E-02	37352
kuster3.yz161.1gs	158	261	0.3924E-01	0.2666E-02	37435
kuster3.yz162.1gs	158	261	0.3883E-01	0.2609E-02	37529
kuster3.yz163.1gs	159	262	0.3844E-01	0.2546E-02	37595
kuster3.yz164.1gs	159	262	0.3794E-01	0.2499E-02	37698
kuster3.yz165.1gs	159	262	0.3742E-01	0.2447E-02	37773
kuster3.yz166.1gs	157	261	0.3680E-01	0.2401E-02	37856
kuster3.yz167.1gs	158	262	0.3646E-01	0.2353E-02	37925
kuster3.yz168.1gs	155	260	0.3627E-01	0.2306E-02	37981
kuster3.yz169.1gs	155	260	0.3579E-01	0.2263E-02	38076
kuster3.yz170.1gs	166	267	0.3564E-01	0.2213E-02	38108
kuster3.yz171.1gs	166	267	0.3525E-01	0.2168E-02	38151
kuster3.yz172.1gs	155	260	0.3449E-01	0.2122E-02	38165
kuster3.yz173.1gs	166	267	0.3437E-01	0.2087E-02	38190
kuster3.yz174.1gs	166	267	0.3392E-01	0.2046E-02	38232
kuster3.yz175.1gs	171	269	0.3376E-01	0.1997E-02	38244
kuster3.yz176.1gs	171	269	0.3338E-01	0.1955E-02	38275
kuster3.yz177.1gs	171	269	0.3284E-01	0.1923E-02	38309
kuster3.yz178.1gs	159	263	0.3240E-01	0.1886E-02	38322
kuster3.yz179.1gs	171	269	0.3200E-01	0.1857E-02	38354
kuster3.yz180.1gs	171	269	0.3158E-01	0.1827E-02	38382
kuster3.yz181.1gs	168	268	0.3195E-01	0.1799E-02	38385
kuster3.yz182.1gs	170	269	0.3136E-01	0.1768E-02	38394
kuster3.yz183.1gs	166	267	0.3085E-01	0.1741E-02	38422
kuster3.yz184.1gs	166	267	0.3048E-01	0.1716E-02	38425
kuster3.yz185.1gs	166	267	0.3027E-01	0.1694E-02	38431
kuster3.yz186.1gs	168	268	0.2980E-01	0.1668E-02	38417
kuster3.yz187.1gs	168	268	0.2943E-01	0.1649E-02	38419
kuster3.yz188.1gs	168	268	0.2916E-01	0.1626E-02	38419
kuster3.yz189.1gs	168	268	0.2880E-01	0.1603E-02	38390
kuster3.yz190.1gs	168	268	0.2834E-01	0.1584E-02	38392
kuster3.yz191.1gs	165	266	0.2778E-01	0.1560E-02	38372
kuster3.yz192.1gs	161	264	0.2748E-01	0.1541E-02	38348
kuster3.yz193.1gs	164	265	0.2665E-01	0.1518E-02	38292
kuster3.yz194.1gs	162	264	0.2636E-01	0.1496E-02	38224
kuster3.yz195.1gs	162	264	0.2613E-01	0.1482E-02	38167
kuster3.yz196.1gs	162	264	0.2584E-01	0.1458E-02	38115
kuster3.yz197.1gs	164	265	0.2566E-01	0.1435E-02	38040
kuster3.yz198.1gs	168	267	0.2497E-01	0.1415E-02	37970
kuster3.yz199.1gs	158	11	0.2521E-01	0.1401E-02	37917
kuster3.yz200.1gs	158	11	0.2553E-01	0.1374E-02	37690
kuster3.yz201.1gs	158	11	0.2604E-01	0.1360E-02	37607
kuster3.yz202.1gs	158	11	0.2661E-01	0.1352E-02	37544
kuster3.yz203.1gs	159	12	0.2712E-01	0.1338E-02	37459
kuster3.yz204.1gs	157	11	0.2804E-01	0.1332E-02	37297
kuster3.yz205.1gs	157	11	0.2790E-01	0.1325E-02	37204
kuster3.yz206.1gs	157	11	0.2744E-01	0.1315E-02	37086
kuster3.yz207.1gs	157	11	0.2723E-01	0.1314E-02	36982
kuster3.yz208.1gs	156	11	0.2738E-01	0.1308E-02	36867
kuster3.yz209.1gs	156	11	0.2696E-01	0.1304E-02	36700
kuster3.yz210.1gs	156	11	0.2626E-01	0.1304E-02	36563
kuster3.yz211.1gs	156	11	0.2564E-01	0.1310E-02	36420
kuster3.yz212.1gs	156	11	0.2544E-01	0.1313E-02	36273

Name of Slice Data File	Peak SAR y and z coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
kuster3.yz213.1gs	156	11	0.2516E-01	0.1315E-02	36115
kuster3.yz214.1gs	156	11	0.2485E-01	0.1320E-02	35921
kuster3.yz215.1gs	156	11	0.2454E-01	0.1311E-02	35566
kuster3.yz216.1gs	157	11	0.2339E-01	0.1314E-02	35349
kuster3.yz217.1gs	157	11	0.2287E-01	0.1320E-02	35144
kuster3.yz218.1gs	157	11	0.2283E-01	0.1325E-02	34936
kuster3.yz219.1gs	157	11	0.2239E-01	0.1328E-02	34691
kuster3.yz220.1gs	158	11	0.2171E-01	0.1335E-02	34472
kuster3.yz221.1gs	158	11	0.2178E-01	0.1339E-02	34206
kuster3.yz222.1gs	159	11	0.2120E-01	0.1340E-02	33917
kuster3.yz223.1gs	159	11	0.2119E-01	0.1338E-02	33651
kuster3.yz224.1gs	160	11	0.2063E-01	0.1334E-02	33359
kuster3.yz225.1gs	160	11	0.2056E-01	0.1336E-02	33052
kuster3.yz226.1gs	161	11	0.1973E-01	0.1336E-02	32736
kuster3.yz227.1gs	161	11	0.1973E-01	0.1333E-02	32368
kuster3.yz228.1gs	162	11	0.1926E-01	0.1333E-02	31983
kuster3.yz229.1gs	163	11	0.1829E-01	0.1331E-02	31556
kuster3.yz230.1gs	164	11	0.1752E-01	0.1312E-02	30650
kuster3.yz231.1gs	164	11	0.1750E-01	0.1316E-02	30129
kuster3.yz232.1gs	165	11	0.1663E-01	0.1322E-02	29605
kuster3.yz233.1gs	166	11	0.1587E-01	0.1328E-02	29036
kuster3.yz234.1gs	166	11	0.1587E-01	0.1337E-02	28414
kuster3.yz235.1gs	166	11	0.1566E-01	0.1351E-02	27783
kuster3.yz236.1gs	167	11	0.1494E-01	0.1365E-02	27011
kuster3.yz237.1gs	168	11	0.1429E-01	0.1382E-02	26189
kuster3.yz238.1gs	169	11	0.1350E-01	0.1404E-02	24998
kuster3.yz239.1gs	170	11	0.1281E-01	0.1428E-02	24003
kuster3.yz240.1gs	182	253	0.1207E-01	0.1451E-02	23067
kuster3.yz241.1gs	181	252	0.1174E-01	0.1472E-02	22154
kuster3.yz242.1gs	181	251	0.1121E-01	0.1478E-02	21293
kuster3.yz243.1gs	186	252	0.1082E-01	0.1480E-02	20442
kuster3.yz244.1gs	183	250	0.1049E-01	0.1484E-02	19598
kuster3.yz245.1gs	188	250	0.9804E-02	0.1464E-02	18008
kuster3.yz246.1gs	184	247	0.9236E-02	0.1468E-02	17216
kuster3.yz247.1gs	188	248	0.9032E-02	0.1471E-02	16441
kuster3.yz248.1gs	189	247	0.8509E-02	0.1476E-02	15660
kuster3.yz249.1gs	192	247	0.8033E-02	0.1481E-02	14860
kuster3.yz250.1gs	192	246	0.7841E-02	0.1484E-02	14056
kuster3.yz251.1gs	191	244	0.7207E-02	0.1493E-02	13294
kuster3.yz252.1gs	192	243	0.6682E-02	0.1508E-02	12518
kuster3.yz253.1gs	195	243	0.6258E-02	0.1522E-02	11764
kuster3.yz254.1gs	197	242	0.5690E-02	0.1537E-02	10998
kuster3.yz255.1gs	198	11	0.5717E-02	0.1547E-02	10214
kuster3.yz256.1gs	201	11	0.5614E-02	0.1515E-02	9464
kuster3.yz257.1gs	204	11	0.5638E-02	0.1474E-02	8714
kuster3.yz258.1gs	208	11	0.5417E-02	0.1484E-02	7970
kuster3.yz259.1gs	211	11	0.5246E-02	0.1476E-02	7232

Location and values for peak and average 1 gram average SAR for total volume of exposed tissue

kuster3.yz60.1gsa	**226**	**117**	**0.1532E+01**	**0.6501E-02**	**5611108**

Figure 3.6 illustrates the orientation of the Kuster head model with respect to the antenna in the sagittal or xz plane at y = 228 mm from the origin of the rectangular coordinate system at the lower-front-left corner of the fdtd mesh. The horizontal black lines, A through I denotes the horizontal xy planes where the SAR data was plotted and printed. However, SAR data were calculated for all of the 210, 1-mm thick horizontal xy slices as well as for the vertical slices denoted by J through U in the sagittal xz plane of the simulated head tissue illustrated in Figure 3.6.

Figure 6.8 illustrates the FDTD derived SAR distribution in xz planes through the head corresponding to the vertical slices V (through the center of the left row of antenna patches), W (through the center of the array of patches) and X (through the right row of patches) defined in Figure 3.7. The SAR distributions as averaged over each 1 mm cubical cell or voxel, calculated by the FDTD program are depicted as a color graphs with each color representing a 9 dB range of SAR values. The maximum SAR corresponding to the 0-dB reference is shown below each graph. Note that the SAR in the head drops to levels lower than -36 decibels with respect to the maximum of 3.18 W/kg at or near the facial surface of the model denoted by the black plus sign in scan W.

Figures 6.9, 6.10 and 6.11 respectively illustrate the SAR distribution in the horizontal xy planes at slices labeled as A through C, D through F, and G through I as denoted in Figure 3.6. In these figures each color representing the SAR distribution as averaged over each 1-mm cubical cell corresponds to a 6-dB range of SAR values. The maximum SAR corresponding to 0 dB is listed below each graph in the figure. The maximum SAR for all of these illustrated slices is 2.93 W/kg occurring at the location of the black plus sign in the scan through the slice denoted as E in Figure 6.10.

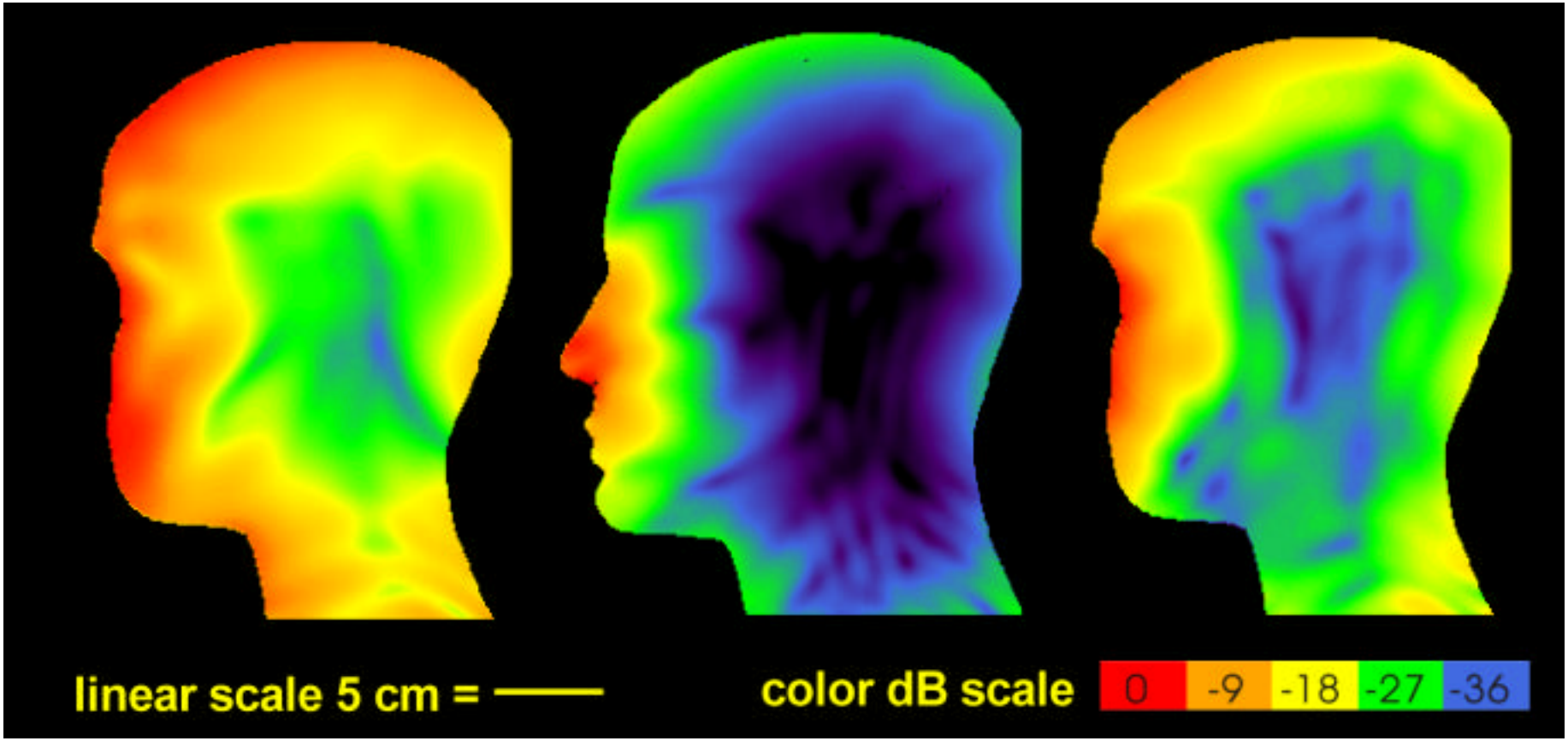
Figures 6.12, 6.13 and 6.14 illustrate the respective color plots of the SAR distribution in the vertical yz planes denoted by L through O, P through R, and S through U as identified in Figures 3.6 and 6.7. The legend for these plots is the same as used for the previous figures. The maximum value of the SAR for the entire head model is 3.49 W/kg occurring at the location of the black plus sign in scan through the slice denoted as K in Figure 6.12.

Figures 6.15, 6.16 and 6.17 illustrate the respective color plots of the 1-gram average SAR distribution in the yz planes denoted by K through O, P through R, and S through U as identified in Figures 3.6 and 3.7. The legend for these plots is set for the color red to represent all SARs at or greater than the value 1.6 W/kg allowed by the FCC MPL. The maximum value of the SAR for each plot is shown in the text below the plots. The maximum 1-gram average for the entire head model, 1.53 W/kg occurs at the location of the black plus sign in the slice denoted as K in Figure 6.15.

Figure 6.18 illustrates a comparison between the FDTD maximum derived values of peak and 1 gram average SAR in each yz plane slice of the Kuster head as a function of distance x from the ground plane and the SPEAG measured values at 76-mm and 81-mm, respectively given in the last two figures in SubAppendix H of Appendix A. The maximum measured SAR of 0.0545 W/kg (based on 80 mW input power to the antenna) in the yz plane at x=76-mm is very close to the calculated 1 gram average value of 0.0532 W/kg. However, the maximum measured SAR of 0.0307 W/kg in the yz plane at x=81-mm falls below the calculated 1-gram average value of 0.0522 W/kg. As explained in the discussion relating to Figures 6.6 and 6.7 in the Section 6.1 this probably results from the fact that the measurement probe cannot be placed at the tissue periphery where the highest SARs occur in the yz planes further from the source. The graph in Figure 6.18 clearly indicates a dual slope characteristic where the calculated SAR curve decays very rapidly with distance up to 76-mm from the ground plane followed by a much smaller rate of decay where the SAR at the surface exceeds that at the interior of the model. When the comparisons of the calculated and measured SARs are made along the same line through the model there is very good agreement in the results. This is illustrated by the comparison of FDTD calculations and the SPEAG measurement results obtained from Figure 3.10a of Appendix A. These results obtained along a line perpendicular to the antenna through the nose of the model as a function of distance from the ground plane are shown in Figure 6.19. For this case the rapid decay of the SAR with distance prevails to a distance of 155-mm from the source before the higher SAR at the back surface of the model begins to affect the SAR curve, causing it to increase with decreasing distance to the back surface of the model. For this case the agreement between the calculated values denoted by the blue curve and the measured values denoted by the red curve is so close that the curves lay virtually on the top of each other

6.3 Orientation with Side of Head in contact with Radome in various positions

SPEAG conducted measurements on another model called the Generic Twin Phantom exposed to the AT&T RU antenna with the side of the head in contact with the radome and oriented over center of the array and each patch. These results are discussed in Appendix A, pages 33 and 34 and Sub-Appendix I. The results, summarized in Table 3.2 of Appendix A show maximum 1 gram average SARs varying from 0.22 to 0.43 W/kg (-8.6 to -5.7 dB from the FCC MPL) with the maximum occurring exposures near the bottom right patch.

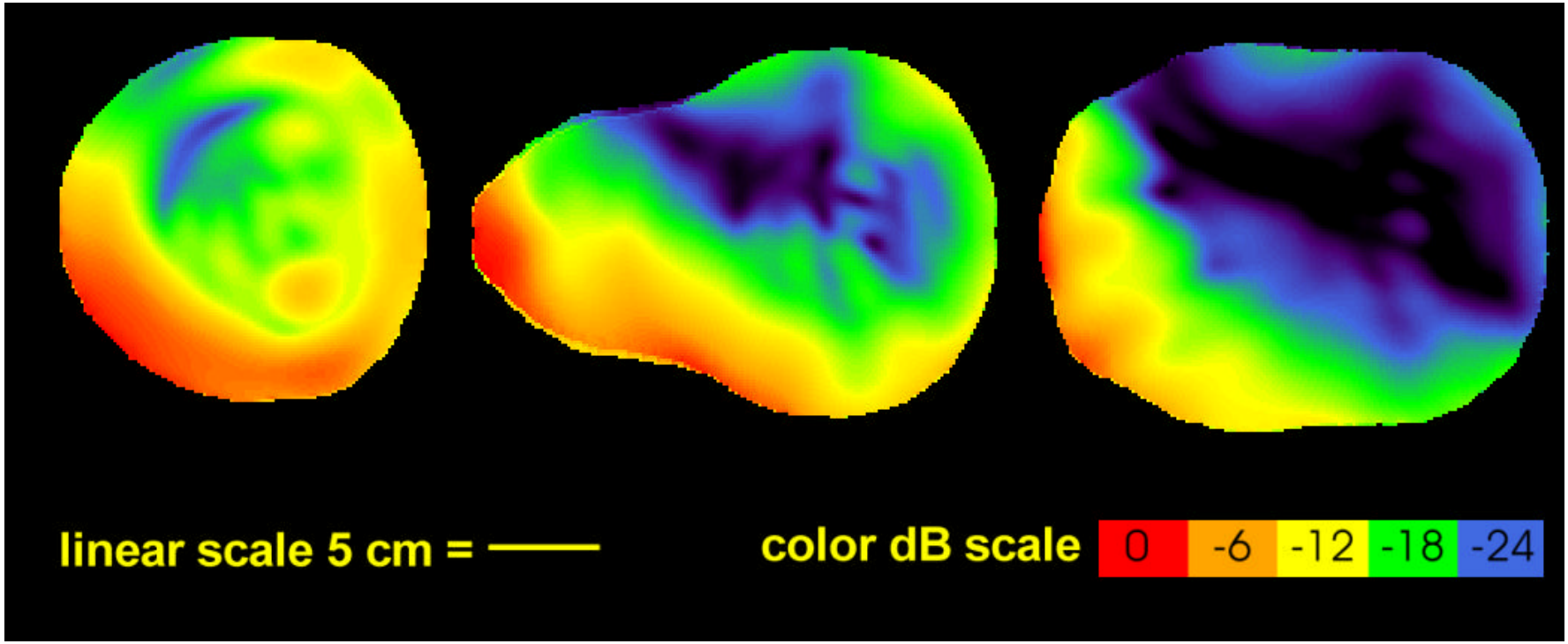


scan V, slice 190
0 dB = 0.0834 W/kg

scan W, slice 228
0 dB = 3.18 W/kg

scan X, slice 265
0 dB = 0.0967 W/kg

Figure 6.8. FDTD derived x-z plane SAR distributions (V-X) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch (black + denotes position nearest maximum SAR for entire model).

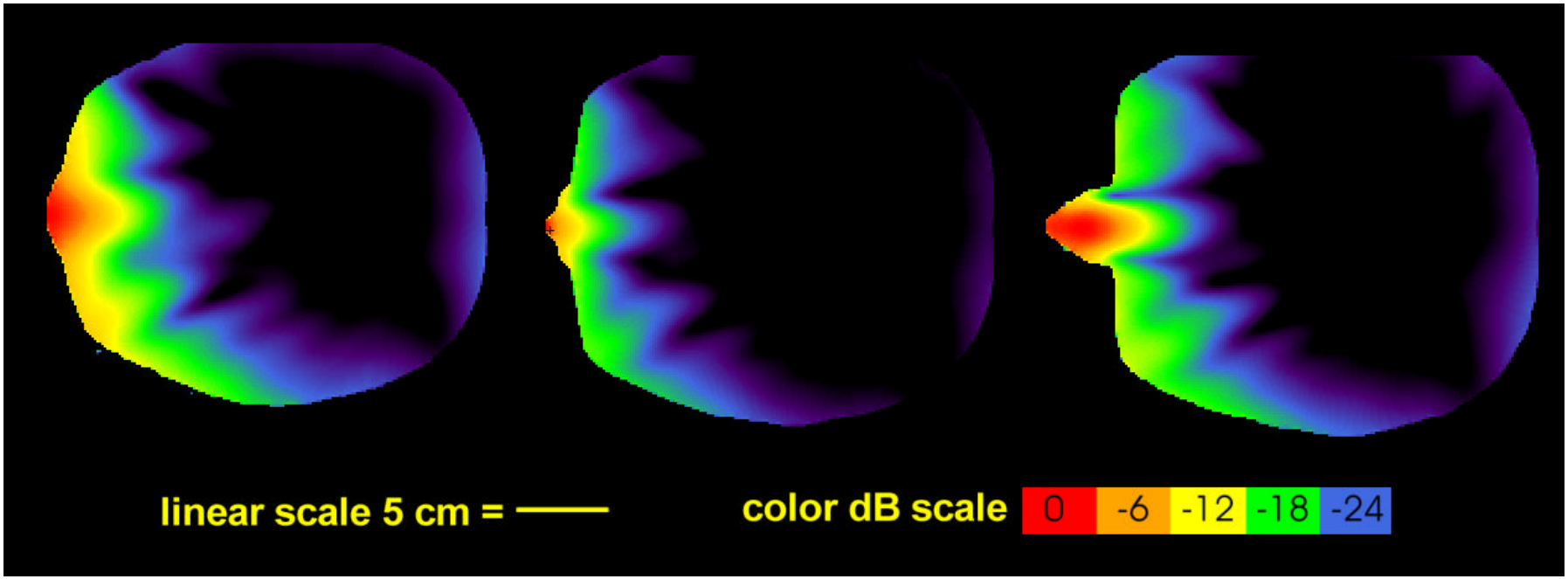


scan A, slice 25
0 dB = 0.0214 W/kg

scan B, slice 55
0 dB = 0.0333 W/kg

scan C, slice 75
0 dB = 0.0992 W/kg

Figure 6.9. FDTD derived x-y plane SAR distributions (A-C) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch.

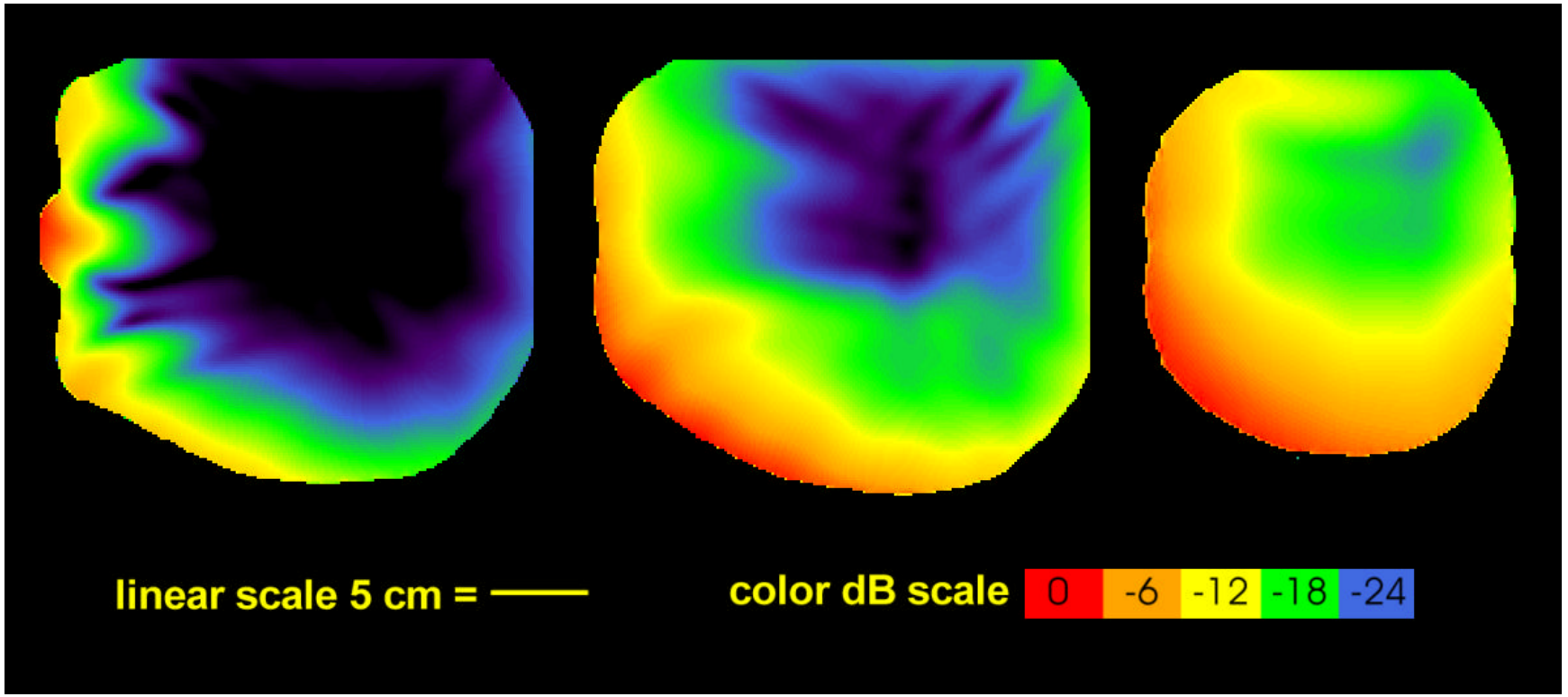


scan D, slice 105
0 dB = 0.623 W/kg

scan E, slice 115
0 dB = 2.93 W/kg

scan F, slice 126
0 dB = 1.37 W/kg

Figure 6.10. FDTD derived x-y plane SAR distributions (D-F) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch patch (black + denotes position nearest maximum SAR for entire model).

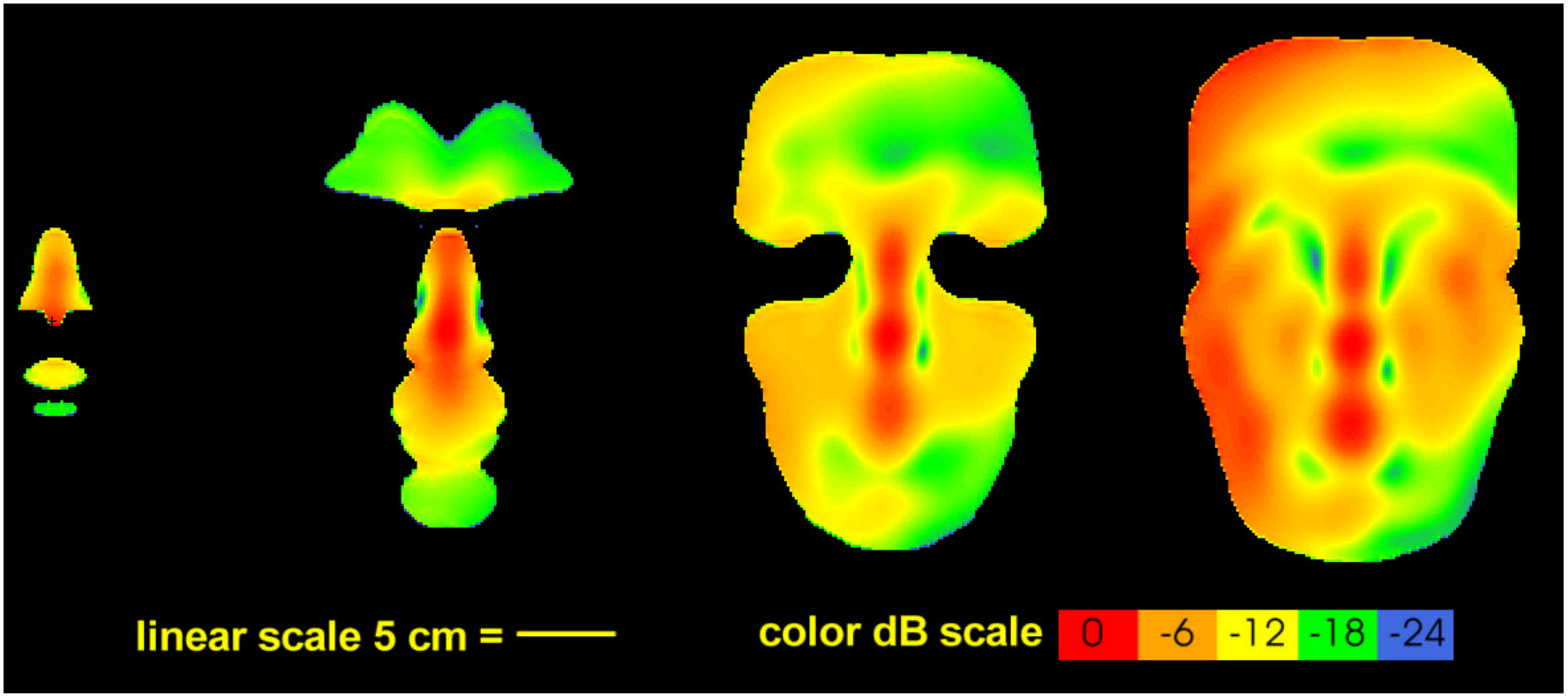


scan G, slice 170
0 dB = 0.286 W/kg

scan H, slice 210
0 dB = 0.0614 W/kg

scan I, slice 255
0 dB = 0.0784 W/kg

Figure 6.11. FDTD derived x-y plane SAR distributions (G-I) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch.



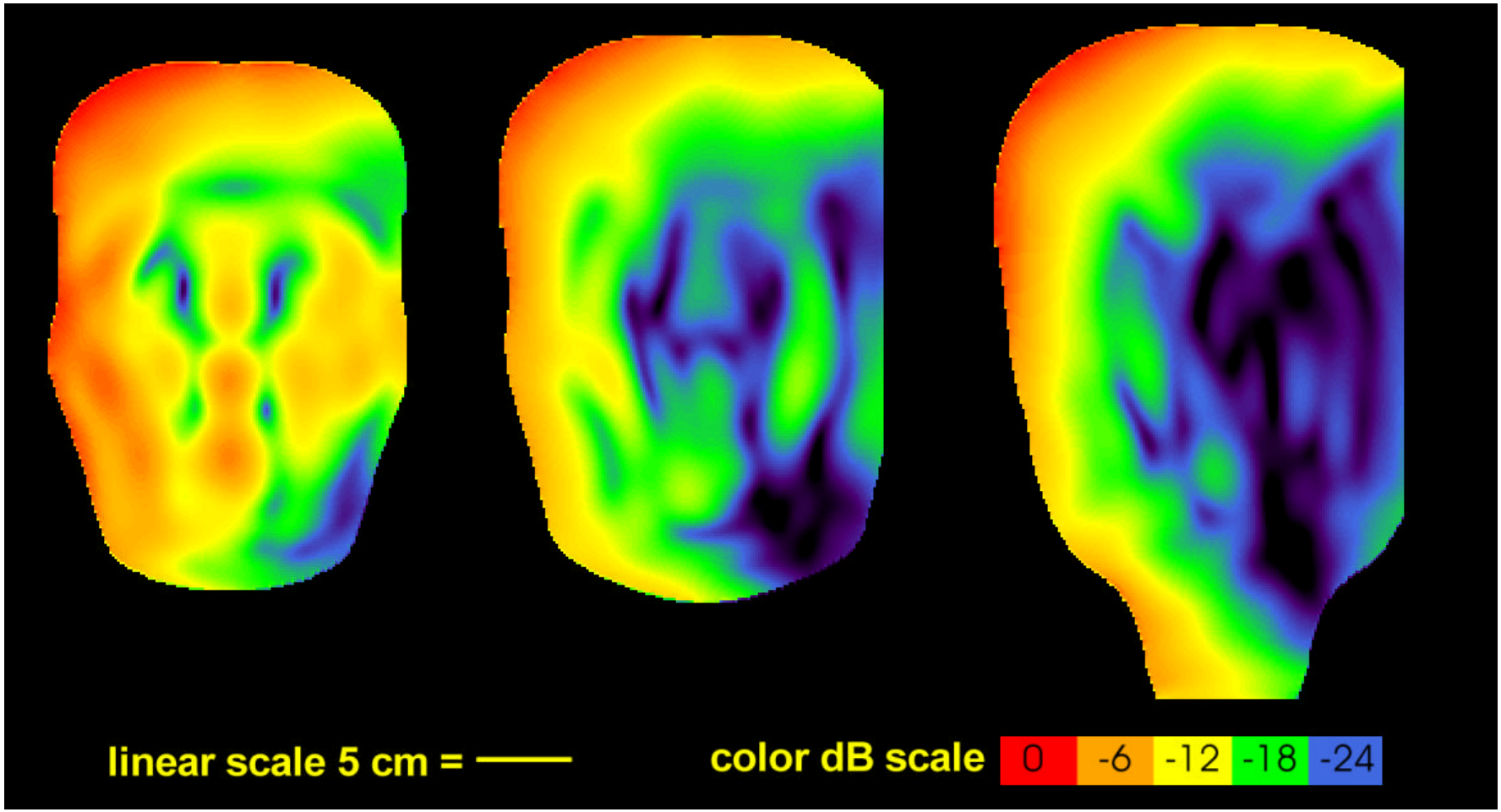
scan L, slice 63
0 dB = 3.49 W/kg

scan M, slice 70
0 dB = 0.977 W/kg

scan N, slice 80
0 dB = 0.320 W/kg

scan O, slice 90
0 dB = 0.0829 W/kg

Figure 6.12. FDTD derived x-y plane SAR distributions (L-O) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch (black + denotes position of maximum SAR for entire model.

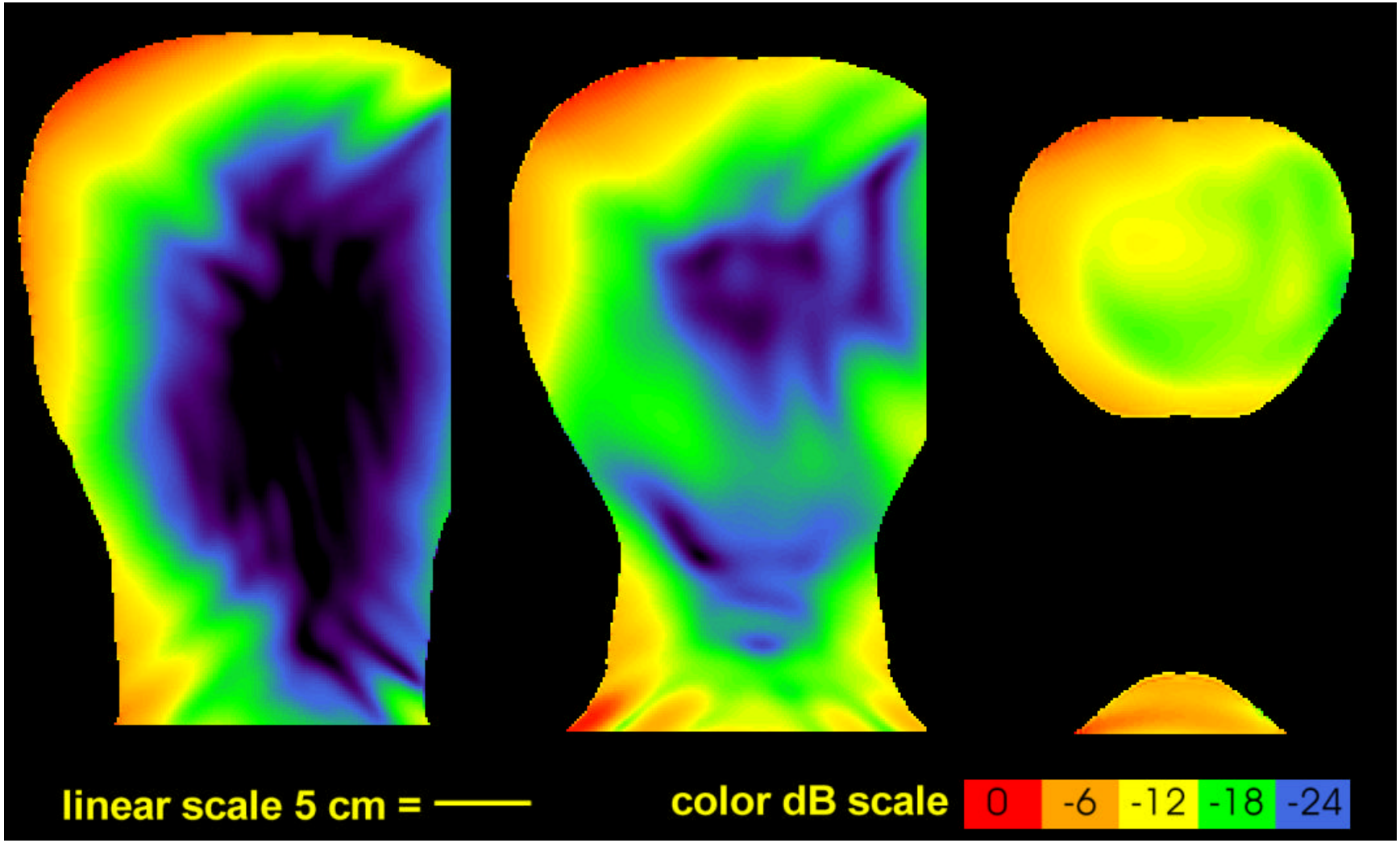


scan P, slice 100
0 dB = 0.0714 W/kg

scan Q, slice 120
0 dB = 0.0982 W/kg

scan R, slice 140
0 dB = 0.0723 W/kg

Figure 6.13. FDTD derived y-z plane SAR distributions (P-R) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch.

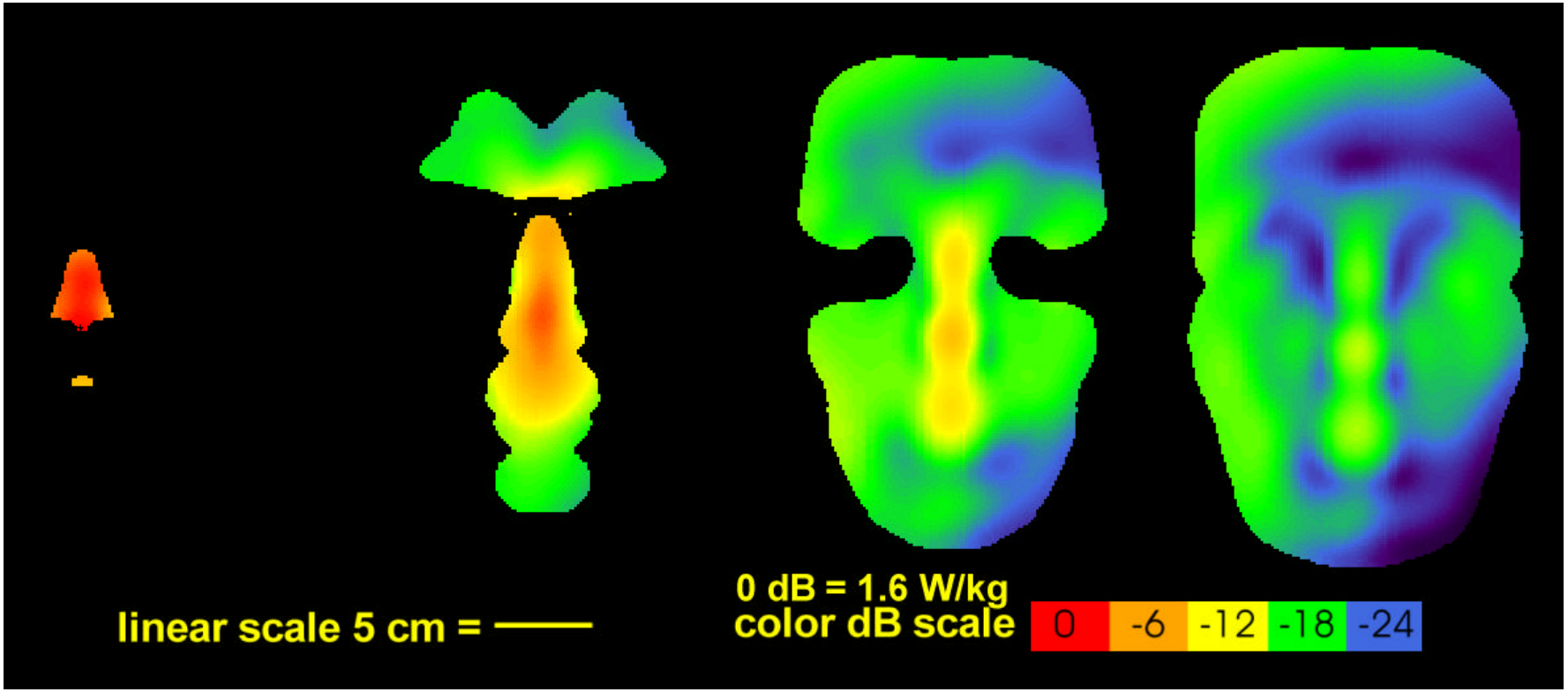


scan S, slice 180
0 dB = 0.0531 W/kg

scan T, slice 220
0 dB = 0.0296 W/kg

scan U, slice 250
0 dB = 0.0163 W/kg

Figure 6.14. FDTD derived y-z plane SAR distributions (S-R) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch.



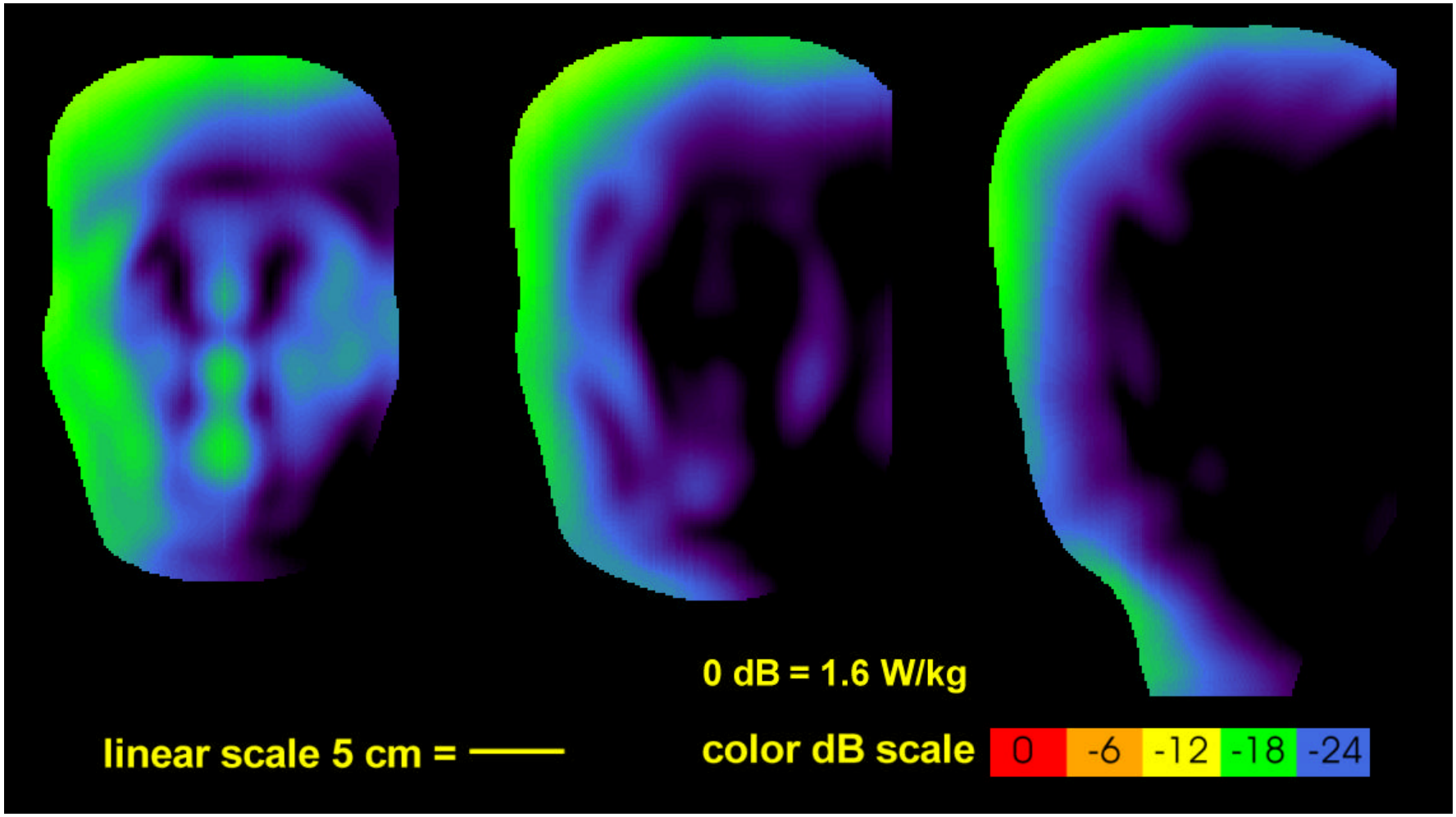
scan K, slice 63 Max. = 1.53 W/kg

scan M, slice 70 Max. = 0.763 W/kg

scan N, slice 80 Max. = 0.258 W/kg

scan O, slice 90 Max. = 0.0701 W/kg

Figure 6.15. FDTD derived x-y plane 1 gram average SAR distributions (K-O) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch compared to FCC MPL (black + denotes position of maximum SAR for entire model).

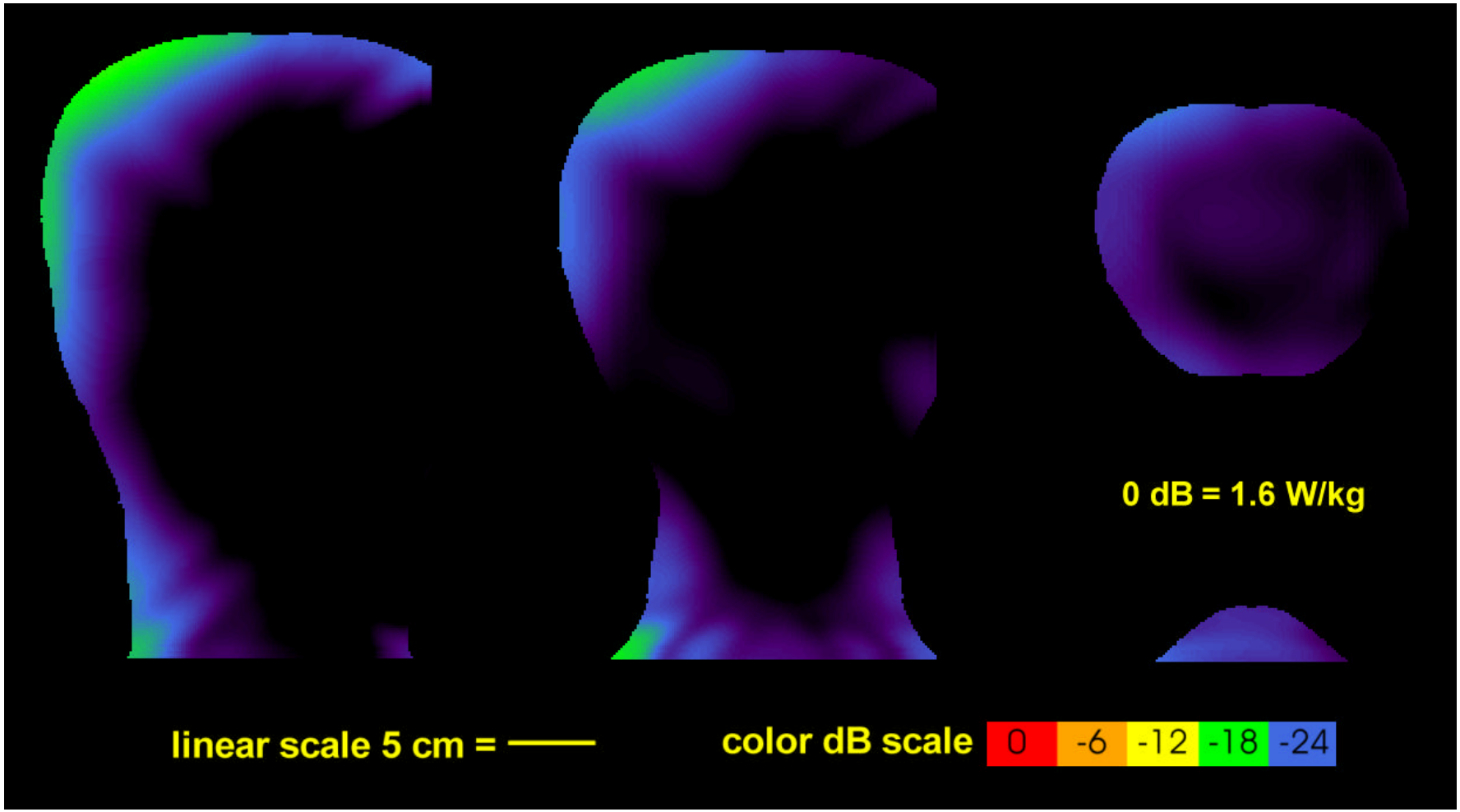


scan P, slice 100
Max. = 0.0519 W/kg

scan Q, slice 120
Max. = 0.0569 W/kg

scan R, slice 140
Max. = 0.0488 W/kg

Figure 6.16. FDTD derived y-z plane 1 gram average SAR distributions (P-R) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch.



scan S, slice 180
Max. = 0.0519 W/kg

scan T, slice 220
Max. = 0.0569 W/kg

scan U, slice 250
Max. = 0.0488 W/kg

Figure 6.17. FDTD derived y-z plane 1 gram average SAR distributions (S-U) in Kuster model head exposed to AT&T RU Antenna with tip of nose in contact with radome and centered over lower right patch compared to FCC MPL.

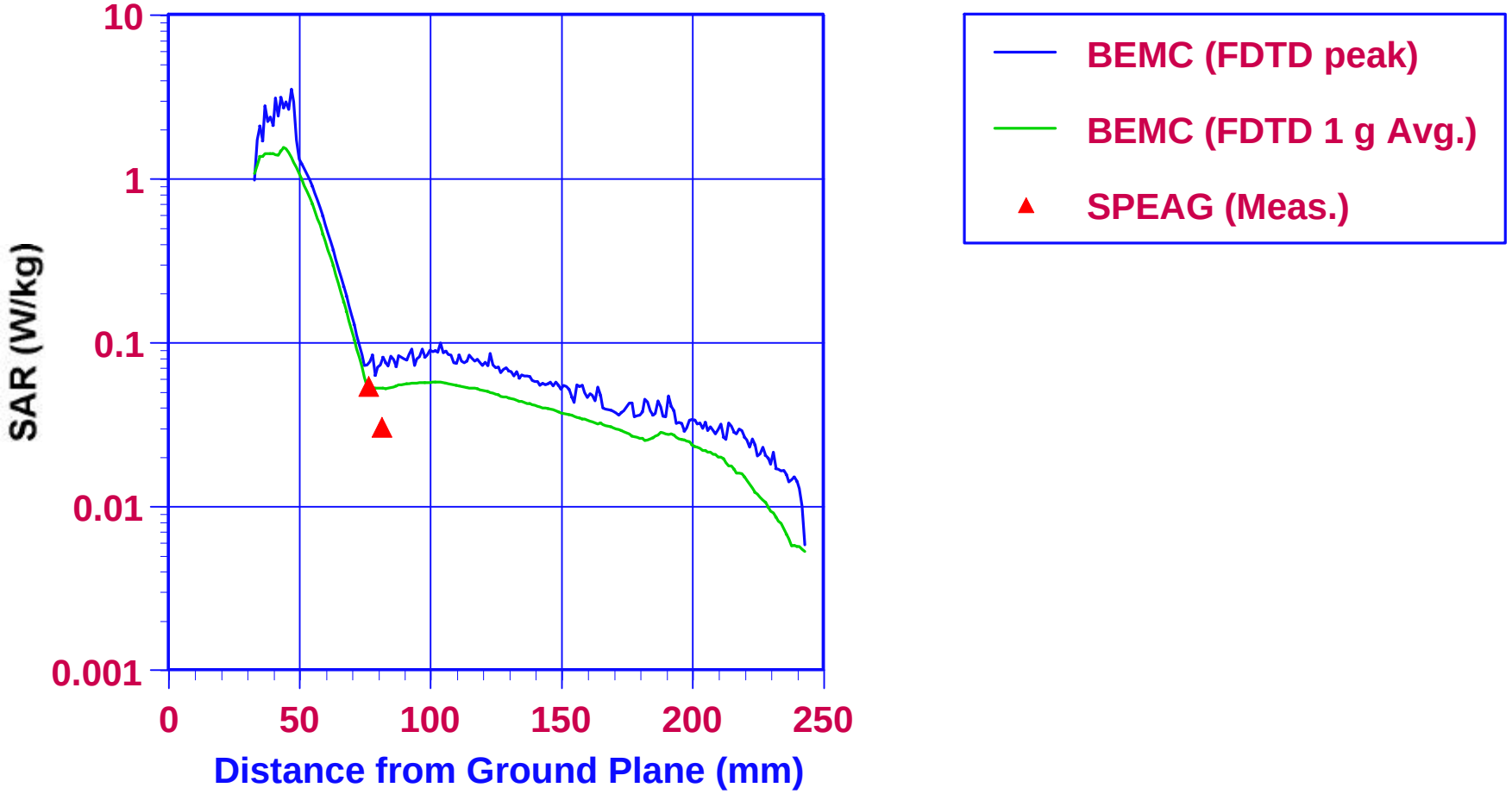


Figure 6.18. Comparison of FDTD maximum derived values of peak and 1 gram average SAR by BEMC in each yz plane slice of the Kuster head model as a function of distance x from ground plane with face of Kuster phantom head model exposed to AT&T RU antenna with tip of nose in contact with radome (31 cm from ground plane) and centered over lower right patch (red symbols indicate SPEAG measured values taken 76-mm and 81-mm from the ground plane, respectively).

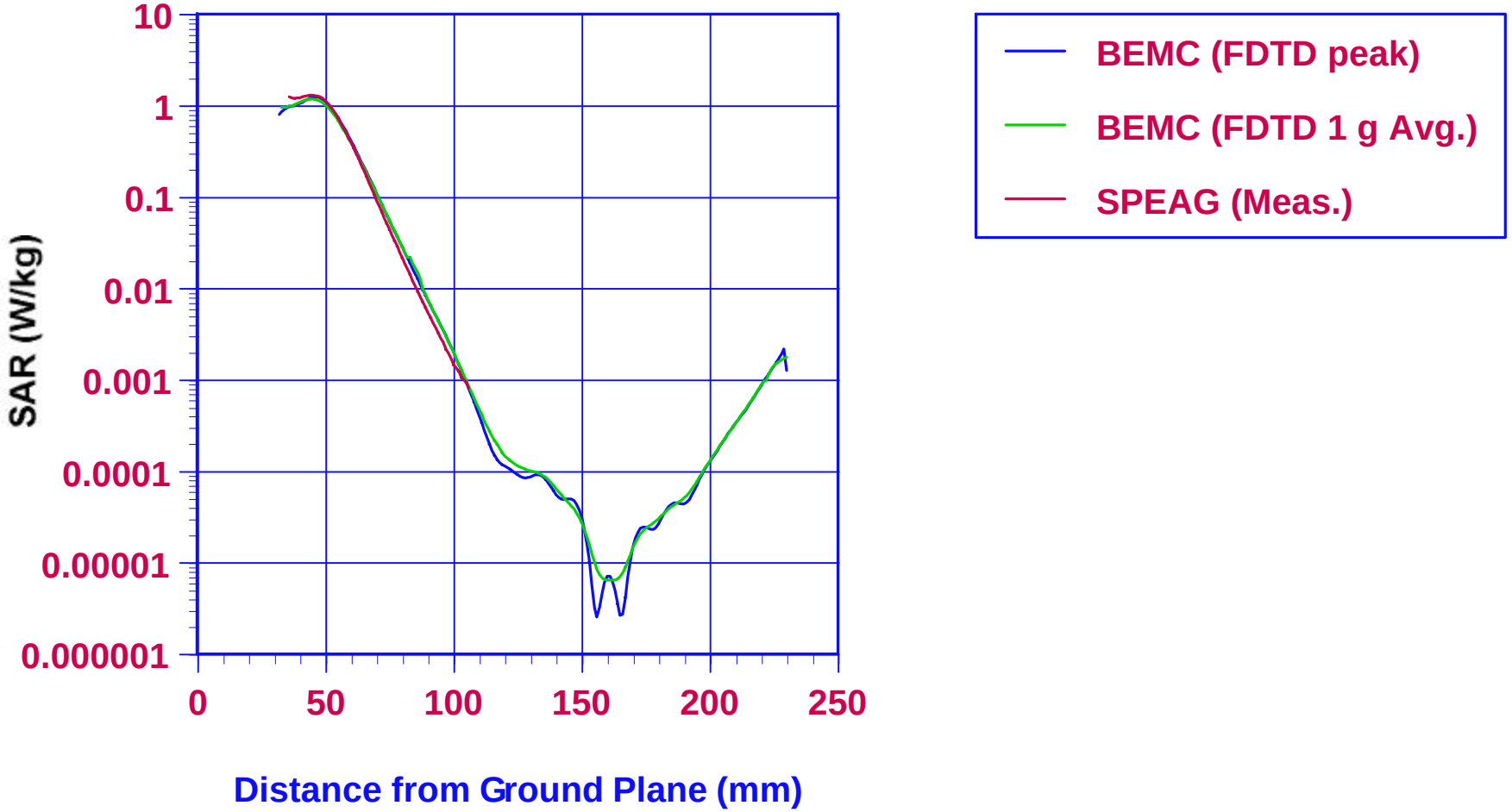


Figure 6.19. Comparison of FDTD derived values of SAR by BEMCand measured values by SPEAG with face of Kuster phantom head model exposed to AT&T RU antenna with tip of nose in contact with radome (31 cm from ground plane) and centered over lower right patch (values plotted along line through tip of nose and perpendicular to ground plane).

7 FDTD Calculation of SAR in REMCOM Head and Shoulders Inhomogeneous Model

FDTD calculations were made of the peak and 1-gram average of the SARs in the REMCOM inhomogeneous head model (described in section 3.3) exposed to the AT&T RU antenna. The head was exposed with the face toward the antenna with the nose in direct contact with the radome at 9-mm below the geometric center of the 4-patch array. Graphical SAR data files and plots calculated throughout the entire head model was scaled to correspond to an input power of 79.62 mW to the antenna.

Table 7.1 summarizes the calculated results of both the peak and average SARs calculated for each 1-mm thick slice in the xy plane as well as for the entire exposed head model. The format of the table is the same as that used in Tables 6.1 and 6.3. It may be noted from the table that the maximum SAR of 0.439 W/kg for the entire head model is in the 213th slice (file attremh.xy213.sar) at x=73 mm and y=163 mm and the average SAR for the 24614 cells for that slice is 0.002678 W/kg. It can also be seen at the bottom of the table that the SAR as averaged over the 5694630 cells of the entire head is 0.003965 W/kg. The 0.4388 W/kg maximum peak SAR for the inhomogeneous head is more than twice the value found for the homogeneous head model for the same exposure conditions. The higher SAR will later be shown to be due to an artifact resulting from a sharp corner of an air void within the nasal tissue resulting from the cubical shape of the FDTD cells. Sharp corners made by the cubical FDTD cells can cause a "staircasing" effect that results in a much higher than average peak SAR in the small 1-mm cubical volume because of its effect in intensifying the field when at the edge of a medium with a much lower permittivity such as air. This would not occur in real tissue and if the SAR is averaged over several adjacent FDTD cells the SAR should be about the same as for tissue at a more realistic smooth interface.

Table 7.2 illustrates the results of the 1-gram averaging of the FDTD output data, which can be related to the FCC MPL. It may be noted from the table that the highest 1-gram average SAR of 0.06860 W/kg occurs in the slice at z=113 mm, x=94 mm and y=149 mm. This is 13.7 dB below FCC MPL of 1.6 W/kg.. Using the same procedure as outlined in the previous section for the homogeneous head, the total absorbed power is calculated to be 22.494 mW which is 28.3% of the antenna input power and the whole-body averaged SAR for an adult man with a head similar to that of the REMCOM phantom head would be somewhere between 0.001377 and 0.003965 W/kg or from 20 to 58 times less than that allowed by the FCC MPL of 0.08 W/kg.

Table 7.1. Slice and Whole Head Model Peak and average SAR (averaged over slice) for Kuster Head and Shoulders Model Exposed to AT&T RU Antenna with Nose in Contact with Radome 9 mm Below Middle of Patch Array and (slice file number is distance in mm from FDTD space rectangular coordinates origin in z direction).

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy78.sar	145	160	0.6046E-01	0.4927E-02	27429
attremh.xy79.sar	145	160	0.6005E-01	0.4924E-02	27433
attremh.xy80.sar	145	160	0.5778E-01	0.4962E-02	27433
attremh.xy81.sar	145	160	0.5457E-01	0.4872E-02	27159
attremh.xy82.sar	145	160	0.5098E-01	0.4797E-02	27160
attremh.xy83.sar	130	119	0.8517E-01	0.4866E-02	27159
attremh.xy84.sar	132	117	0.5704E-01	0.4904E-02	26858
attremh.xy85.sar	132	117	0.5738E-01	0.4770E-02	26899
attremh.xy86.sar	127	139	0.7120E-01	0.4851E-02	26897
attremh.xy87.sar	130	116	0.9118E-01	0.4831E-02	26526
attremh.xy88.sar	129	117	0.6445E-01	0.5602E-02	27494
attremh.xy89.sar	115	174	0.9941E-01	0.5634E-02	27491
attremh.xy90.sar	111	132	0.6250E-01	0.5112E-02	27051
attremh.xy91.sar	123	180	0.8779E-01	0.4998E-02	27266
attremh.xy92.sar	109	144	0.1007E+00	0.5002E-02	27261
attremh.xy93.sar	111	126	0.6573E-01	0.4739E-02	26353
attremh.xy94.sar	109	141	0.5874E-01	0.4524E-02	26481
attremh.xy95.sar	112	121	0.1023E+00	0.4556E-02	26475
attremh.xy96.sar	93	159	0.6959E-01	0.4627E-02	25775
attremh.xy97.sar	93	159	0.6399E-01	0.4500E-02	25816
attremh.xy98.sar	91	162	0.1231E+00	0.4580E-02	25808
attremh.xy99.sar	90	158	0.9349E-01	0.4721E-02	25131
attremh.xy100.sar	88	156	0.7803E-01	0.4707E-02	25302
attremh.xy101.sar	91	165	0.1409E+00	0.4875E-02	25295
attremh.xy102.sar	90	135	0.9982E-01	0.4812E-02	24551
attremh.xy103.sar	90	135	0.8192E-01	0.4672E-02	24639
attremh.xy104.sar	88	134	0.1366E+00	0.4881E-02	24633
attremh.xy105.sar	91	132	0.1050E+00	0.5057E-02	24116
attremh.xy106.sar	91	132	0.9441E-01	0.4945E-02	24185
attremh.xy107.sar	89	168	0.1221E+00	0.5285E-02	24177
attremh.xy108.sar	94	151	0.1121E+00	0.5369E-02	23502
attremh.xy109.sar	94	151	0.1230E+00	0.5311E-02	23576
attremh.xy110.sar	94	151	0.1514E+00	0.5540E-02	23568
attremh.xy111.sar	94	148	0.1282E+00	0.5670E-02	23167
attremh.xy112.sar	94	149	0.1333E+00	0.5567E-02	23131
attremh.xy113.sar	106	109	0.1784E+00	0.5707E-02	23125
attremh.xy114.sar	94	146	0.1653E+00	0.5769E-02	22920
attremh.xy115.sar	94	146	0.1589E+00	0.5634E-02	22878
attremh.xy116.sar	94	146	0.1503E+00	0.5703E-02	22872
attremh.xy117.sar	94	149	0.1183E+00	0.5656E-02	22705
attremh.xy118.sar	94	149	0.1079E+00	0.5458E-02	22709
attremh.xy119.sar	91	121	0.1220E+00	0.5482E-02	22707
attremh.xy120.sar	95	144	0.1658E+00	0.5484E-02	22667
attremh.xy121.sar	96	144	0.1265E+00	0.5289E-02	22510
attremh.xy122.sar	91	121	0.1165E+00	0.5234E-02	22509
attremh.xy123.sar	103	111	0.1187E+00	0.5159E-02	22569
attremh.xy124.sar	103	111	0.9509E-01	0.4899E-02	22482
attremh.xy125.sar	103	107	0.1099E+00	0.4872E-02	22482
attremh.xy126.sar	94	116	0.9258E-01	0.4755E-02	22657

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy127.sar	94	116	0.8019E-01	0.4554E-02	22544
attremh.xy128.sar	94	115	0.1164E+00	0.4618E-02	22535
attremh.xy129.sar	77	153	0.1085E+00	0.4661E-02	22749
attremh.xy130.sar	77	144	0.7445E-01	0.4486E-02	22759
attremh.xy131.sar	76	152	0.1185E+00	0.4619E-02	22758
attremh.xy132.sar	75	150	0.8018E-01	0.4609E-02	23106
attremh.xy133.sar	76	156	0.6846E-01	0.4441E-02	23135
attremh.xy134.sar	73	150	0.9320E-01	0.4577E-02	23134
attremh.xy135.sar	82	125	0.7117E-01	0.4670E-02	23459
attremh.xy136.sar	80	127	0.6880E-01	0.4524E-02	23488
attremh.xy137.sar	82	174	0.9878E-01	0.4654E-02	23488
attremh.xy138.sar	77	130	0.8026E-01	0.4671E-02	23777
attremh.xy139.sar	77	130	0.6782E-01	0.4499E-02	23800
attremh.xy140.sar	76	130	0.9087E-01	0.4593E-02	23800
attremh.xy141.sar	92	186	0.6975E-01	0.4543E-02	24035
attremh.xy142.sar	91	150	0.7059E-01	0.4357E-02	24054
attremh.xy143.sar	97	103	0.9351E-01	0.4430E-02	24053
attremh.xy144.sar	98	112	0.6484E-01	0.4453E-02	24284
attremh.xy145.sar	89	109	0.7041E-01	0.4298E-02	24304
attremh.xy146.sar	91	189	0.8541E-01	0.4382E-02	24302
attremh.xy147.sar	89	109	0.1145E+00	0.4343E-02	24429
attremh.xy148.sar	89	109	0.8723E-01	0.4193E-02	24446
attremh.xy149.sar	88	109	0.1322E+00	0.4244E-02	24446
attremh.xy150.sar	91	108	0.9837E-01	0.4254E-02	24630
attremh.xy151.sar	91	108	0.7453E-01	0.4041E-02	24650
attremh.xy152.sar	97	100	0.8003E-01	0.4058E-02	24650
attremh.xy153.sar	94	105	0.7591E-01	0.4009E-02	24887
attremh.xy154.sar	86	109	0.6363E-01	0.3835E-02	24893
attremh.xy155.sar	86	110	0.7504E-01	0.3843E-02	24892
attremh.xy156.sar	91	104	0.7999E-01	0.3799E-02	25066
attremh.xy157.sar	89	106	0.6857E-01	0.3637E-02	25070
attremh.xy158.sar	89	106	0.7797E-01	0.3618E-02	25069
attremh.xy159.sar	91	108	0.6871E-01	0.3607E-02	25159
attremh.xy160.sar	88	108	0.6055E-01	0.3398E-02	25165
attremh.xy161.sar	89	106	0.7118E-01	0.3364E-02	25164
attremh.xy162.sar	91	105	0.6330E-01	0.3309E-02	25418
attremh.xy163.sar	94	102	0.6196E-01	0.3059E-02	25461
attremh.xy164.sar	92	103	0.6939E-01	0.2988E-02	25460
attremh.xy165.sar	94	101	0.7114E-01	0.2916E-02	25666
attremh.xy166.sar	94	102	0.6467E-01	0.2712E-02	25682
attremh.xy167.sar	97	98	0.8049E-01	0.2673E-02	25681
attremh.xy168.sar	95	102	0.5006E-01	0.2632E-02	25702
attremh.xy169.sar	95	102	0.4757E-01	0.2424E-02	25675
attremh.xy170.sar	85	112	0.5381E-01	0.2404E-02	25675
attremh.xy171.sar	98	99	0.6932E-01	0.2377E-02	25719
attremh.xy172.sar	98	99	0.5786E-01	0.2215E-02	25725
attremh.xy173.sar	98	99	0.5477E-01	0.2221E-02	25724
attremh.xy174.sar	92	101	0.7182E-01	0.2188E-02	25728
attremh.xy175.sar	92	100	0.5687E-01	0.2089E-02	25573
attremh.xy176.sar	94	97	0.8080E-01	0.2119E-02	25573
attremh.xy177.sar	97	99	0.6565E-01	0.2110E-02	25731
attremh.xy178.sar	93	102	0.5895E-01	0.2010E-02	25539
attremh.xy179.sar	93	102	0.6154E-01	0.2044E-02	25539
attremh.xy180.sar	93	104	0.4735E-01	0.2093E-02	25613
attremh.xy181.sar	93	104	0.4913E-01	0.2057E-02	25440

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy182.sar	67	154	0.6716E-01	0.2133E-02	25440
attremh.xy183.sar	70	156	0.1494E+00	0.2291E-02	25634
attremh.xy184.sar	67	156	0.7427E-01	0.2287E-02	24090
attremh.xy185.sar	67	150	0.8171E-01	0.2345E-02	24090
attremh.xy186.sar	67	150	0.1550E+00	0.2465E-02	24449
attremh.xy187.sar	64	149	0.5850E-01	0.2390E-02	24059
attremh.xy188.sar	64	149	0.6541E-01	0.2472E-02	24058
attremh.xy189.sar	64	148	0.1097E+00	0.2716E-02	24462
attremh.xy190.sar	64	151	0.7726E-01	0.2721E-02	24320
attremh.xy191.sar	64	151	0.9479E-01	0.2818E-02	24319
attremh.xy192.sar	64	151	0.1506E+00	0.3008E-02	24624
attremh.xy193.sar	73	142	0.8553E-01	0.2870E-02	24466
attremh.xy194.sar	64	151	0.9383E-01	0.2908E-02	24465
attremh.xy195.sar	64	157	0.1603E+00	0.3018E-02	24506
attremh.xy196.sar	64	159	0.1183E+00	0.2914E-02	24230
attremh.xy197.sar	64	154	0.1944E+00	0.2993E-02	24227
attremh.xy198.sar	112	194	0.1744E+00	0.3071E-02	24295
attremh.xy199.sar	64	157	0.1270E+00	0.2869E-02	23981
attremh.xy200.sar	64	157	0.1545E+00	0.2922E-02	23980
attremh.xy201.sar	64	158	0.1458E+00	0.3025E-02	24143
attremh.xy202.sar	64	160	0.9716E-01	0.2851E-02	23957
attremh.xy203.sar	67	160	0.2710E+00	0.2905E-02	23955
attremh.xy204.sar	67	160	0.4007E+00	0.2982E-02	24126
attremh.xy205.sar	67	160	0.2478E+00	0.2749E-02	24005
attremh.xy206.sar	67	160	0.2303E+00	0.2775E-02	24003
attremh.xy207.sar	67	160	0.2375E+00	0.2860E-02	24157
attremh.xy208.sar	67	160	0.1934E+00	0.2664E-02	24026
attremh.xy209.sar	67	160	0.1682E+00	0.2729E-02	24024
attremh.xy210.sar	76	166	0.2182E+00	0.2677E-02	24278
attremh.xy211.sar	76	166	0.1183E+00	0.2519E-02	24168
attremh.xy212.sar	73	163	0.2349E+00	0.2576E-02	24166
attremh.xy213.sar	73	163	0.4388E+00	0.2678E-02	24614
attremh.xy214.sar	73	163	0.2609E+00	0.2522E-02	24520
attremh.xy215.sar	73	163	0.1947E+00	0.2607E-02	24518
attremh.xy216.sar	73	163	0.1056E+00	0.2699E-02	24864
attremh.xy217.sar	72	163	0.7994E-01	0.2502E-02	24849
attremh.xy218.sar	64	156	0.8309E-01	0.2602E-02	24846
attremh.xy219.sar	69	153	0.1014E+00	0.2594E-02	24915
attremh.xy220.sar	76	163	0.9387E-01	0.2535E-02	24881
attremh.xy221.sar	70	150	0.1760E+00	0.2743E-02	24878
attremh.xy222.sar	76	163	0.1240E+00	0.2794E-02	24804
attremh.xy223.sar	76	163	0.1184E+00	0.2736E-02	24809
attremh.xy224.sar	89	109	0.1217E+00	0.3014E-02	24807
attremh.xy225.sar	89	109	0.1279E+00	0.2958E-02	24854
attremh.xy226.sar	71	153	0.8779E-01	0.2995E-02	24762
attremh.xy227.sar	70	155	0.1353E+00	0.3218E-02	24758
attremh.xy228.sar	79	163	0.1207E+00	0.3234E-02	24952
attremh.xy229.sar	79	163	0.1021E+00	0.3206E-02	24898
attremh.xy230.sar	73	161	0.1204E+00	0.3369E-02	24891
attremh.xy231.sar	75	160	0.1045E+00	0.3420E-02	25024
attremh.xy232.sar	73	155	0.8910E-01	0.3434E-02	25120
attremh.xy233.sar	73	158	0.1252E+00	0.3552E-02	25118
attremh.xy234.sar	75	157	0.8837E-01	0.3511E-02	25827
attremh.xy235.sar	74	154	0.7752E-01	0.3428E-02	25889
attremh.xy236.sar	74	154	0.7234E-01	0.3468E-02	25885

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy237.sar	91	112	0.7635E-01	0.3574E-02	25892
attremh.xy238.sar	91	112	0.6744E-01	0.3381E-02	25953
attremh.xy239.sar	91	101	0.7398E-01	0.3358E-02	25950
attremh.xy240.sar	98	192	0.7307E-01	0.3383E-02	26036
attremh.xy241.sar	83	111	0.5796E-01	0.3187E-02	26107
attremh.xy242.sar	82	113	0.1024E+00	0.3260E-02	26101
attremh.xy243.sar	87	111	0.7455E-01	0.3543E-02	26134
attremh.xy244.sar	84	113	0.6814E-01	0.3324E-02	26141
attremh.xy245.sar	79	117	0.8879E-01	0.3397E-02	26134
attremh.xy246.sar	87	108	0.1128E+00	0.3732E-02	26115
attremh.xy247.sar	87	108	0.1163E+00	0.3705E-02	26092
attremh.xy248.sar	87	106	0.1311E+00	0.3966E-02	26085
attremh.xy249.sar	88	105	0.8927E-01	0.3823E-02	25864
attremh.xy250.sar	84	113	0.7196E-01	0.3918E-02	25926
attremh.xy251.sar	86	198	0.1084E+00	0.4154E-02	25922
attremh.xy252.sar	102	96	0.7116E-01	0.4335E-02	25903
attremh.xy253.sar	102	96	0.7465E-01	0.4388E-02	25892
attremh.xy254.sar	91	201	0.1337E+00	0.4606E-02	25887
attremh.xy255.sar	84	114	0.7532E-01	0.4625E-02	25719
attremh.xy256.sar	84	114	0.8177E-01	0.4620E-02	25696
attremh.xy257.sar	79	117	0.9899E-01	0.4793E-02	25689
attremh.xy258.sar	84	114	0.8915E-01	0.4759E-02	25426
attremh.xy259.sar	87	111	0.9978E-01	0.4664E-02	25376
attremh.xy260.sar	85	109	0.1693E+00	0.4854E-02	25369
attremh.xy261.sar	89	108	0.1070E+00	0.4702E-02	24997
attremh.xy262.sar	81	119	0.8491E-01	0.4567E-02	24988
attremh.xy263.sar	94	103	0.1737E+00	0.4873E-02	24986
attremh.xy264.sar	81	120	0.9433E-01	0.4618E-02	24559
attremh.xy265.sar	92	108	0.9760E-01	0.4399E-02	24550
attremh.xy266.sar	97	103	0.2337E+00	0.4825E-02	24541
attremh.xy267.sar	90	111	0.1212E+00	0.4408E-02	23892
attremh.xy268.sar	94	108	0.9190E-01	0.4222E-02	23889
attremh.xy269.sar	82	121	0.2173E+00	0.4569E-02	23887
attremh.xy270.sar	88	115	0.1151E+00	0.4382E-02	23474
attremh.xy271.sar	97	108	0.9796E-01	0.4285E-02	23465
attremh.xy272.sar	94	109	0.2169E+00	0.4919E-02	23454
attremh.xy273.sar	97	107	0.1166E+00	0.4485E-02	22677
attremh.xy274.sar	95	111	0.8470E-01	0.4317E-02	22662
attremh.xy275.sar	88	122	0.1642E+00	0.4620E-02	22653
attremh.xy276.sar	87	125	0.9287E-01	0.4498E-02	22053
attremh.xy277.sar	97	111	0.8454E-01	0.4449E-02	22053
attremh.xy278.sar	94	115	0.2135E+00	0.4967E-02	22047
attremh.xy279.sar	97	113	0.1096E+00	0.4674E-02	21375
attremh.xy280.sar	91	124	0.7845E-01	0.4469E-02	21399
attremh.xy281.sar	91	127	0.1611E+00	0.4737E-02	21391
attremh.xy282.sar	91	127	0.8621E-01	0.4573E-02	20898
attremh.xy283.sar	97	117	0.7285E-01	0.4443E-02	20898
attremh.xy284.sar	97	118	0.1669E+00	0.4899E-02	20888
attremh.xy285.sar	99	117	0.9367E-01	0.4604E-02	20117
attremh.xy286.sar	101	189	0.7062E-01	0.4394E-02	20102
attremh.xy287.sar	101	189	0.1881E+00	0.4807E-02	20089
attremh.xy288.sar	100	186	0.8589E-01	0.4440E-02	19382
attremh.xy289.sar	103	116	0.6681E-01	0.4217E-02	19382
attremh.xy290.sar	103	115	0.1389E+00	0.4518E-02	19370
attremh.xy291.sar	104	117	0.7133E-01	0.4397E-02	18456

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy292.sar	103	120	0.6634E-01	0.4220E-02	18438
attremh.xy293.sar	103	121	0.1555E+00	0.4667E-02	18426
attremh.xy294.sar	103	121	0.7971E-01	0.4365E-02	17460
attremh.xy295.sar	104	122	0.5715E-01	0.4163E-02	17460
attremh.xy296.sar	106	118	0.1276E+00	0.4655E-02	17448
attremh.xy297.sar	106	120	0.6878E-01	0.4329E-02	16467
attremh.xy298.sar	104	180	0.5771E-01	0.4126E-02	16467
attremh.xy299.sar	106	183	0.1417E+00	0.4631E-02	16454
attremh.xy300.sar	108	125	0.6428E-01	0.4418E-02	15279
attremh.xy301.sar	106	178	0.5507E-01	0.4212E-02	15279
attremh.xy302.sar	112	183	0.1305E+00	0.4725E-02	15267
attremh.xy303.sar	108	176	0.6747E-01	0.4414E-02	14031
attremh.xy304.sar	108	176	0.5251E-01	0.4233E-02	14016
attremh.xy305.sar	109	177	0.1102E+00	0.4776E-02	14005
attremh.xy306.sar	108	137	0.5282E-01	0.4456E-02	12744
attremh.xy307.sar	115	126	0.4514E-01	0.4201E-02	12744
attremh.xy308.sar	112	174	0.1134E+00	0.4686E-02	12734
attremh.xy309.sar	117	126	0.5392E-01	0.4420E-02	11535
attremh.xy310.sar	112	160	0.4138E-01	0.4175E-02	11535
attremh.xy311.sar	112	158	0.1076E+00	0.4691E-02	11526
attremh.xy312.sar	112	158	0.5235E-01	0.4278E-02	10392
attremh.xy313.sar	115	162	0.4302E-01	0.4053E-02	10392
attremh.xy314.sar	115	165	0.1055E+00	0.4549E-02	10383
attremh.xy315.sar	115	160	0.5614E-01	0.4350E-02	9225
attremh.xy316.sar	116	160	0.4641E-01	0.4170E-02	9183
attremh.xy317.sar	118	155	0.9156E-01	0.4646E-02	9174
attremh.xy318.sar	117	157	0.5399E-01	0.4843E-02	8076
attremh.xy319.sar	126	137	0.3500E-01	0.4656E-02	8033
attremh.xy320.sar	127	166	0.8044E-01	0.5063E-02	8025
attremh.xy321.sar	124	162	0.7411E-01	0.5422E-02	6974
attremh.xy322.sar	129	160	0.4952E-01	0.5263E-02	6672
attremh.xy323.sar	133	148	0.6559E-01	0.5690E-02	6665
attremh.xy324.sar	135	155	0.4342E-01	0.5266E-02	5390
attremh.xy325.sar	135	155	0.4275E-01	0.4968E-02	5340
attremh.xy326.sar	139	162	0.8678E-01	0.5399E-02	5333
attremh.xy327.sar	141	161	0.3934E-01	0.4915E-02	4304
attremh.xy328.sar	141	153	0.3676E-01	0.4577E-02	4284
attremh.xy329.sar	142	155	0.6211E-01	0.4995E-02	4275
attremh.xy330.sar	147	166	0.3465E-01	0.5189E-02	3421
attremh.xy331.sar	148	166	0.2834E-01	0.4889E-02	3375
attremh.xy332.sar	148	149	0.6271E-01	0.5266E-02	3371
attremh.xy333.sar	154	171	0.4191E-01	0.7375E-02	2744
attremh.xy334.sar	150	157	0.2229E-01	0.6796E-02	2568
attremh.xy335.sar	160	168	0.3726E-01	0.6364E-02	2565
attremh.xy336.sar	157	165	0.4654E-01	0.9129E-02	2134
attremh.xy337.sar	165	155	0.2953E-01	0.8983E-02	1652
attremh.xy338.sar	166	156	0.3636E-01	0.7737E-02	1650
attremh.xy339.sar	187	163	0.1245E-01	0.5375E-02	908
attremh.xy340.sar	180	139	0.9655E-02	0.4515E-02	646
attremh.xy341.sar	187	148	0.1834E-01	0.3175E-02	641
attremh.xy342.sar	187	148	0.5390E-02	0.1689E-02	58

Location and values for peak and average SAR for total volume of exposed tissue

attremh.xy213.sar	73	163	0.4388E+00	0.3965E-02	5694630

Table 7.2. Slice and Whole Head Model Peak and average (averaged over slice) 1 Gram Average SAR for REMCOM Head and Shoulders Model Exposed to AT&T RU Antenna with Nose in Contact with Radome 9 mm Below Middle of Patch Array and (slice file number is distance in mm from FDTD space rectangular coordinates origin in z direction).

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy78.1gsa	144	164	0.2517E-01	0.4914E-02	27429
attremh.xy79.1gsa	144	164	0.2517E-01	0.4943E-02	27433
attremh.xy80.1gsa	143	164	0.2618E-01	0.4884E-02	27433
attremh.xy81.1gsa	144	164	0.2699E-01	0.4853E-02	27159
attremh.xy82.1gsa	132	116	0.2717E-01	0.4854E-02	27160
attremh.xy83.1gsa	131	119	0.2782E-01	0.4810E-02	27159
attremh.xy84.1gsa	129	119	0.2876E-01	0.4794E-02	26858
attremh.xy85.1gsa	130	119	0.2918E-01	0.4762E-02	26899
attremh.xy86.1gsa	131	117	0.2938E-01	0.4690E-02	26897
attremh.xy87.1gsa	130	119	0.2959E-01	0.4680E-02	26526
attremh.xy88.1gsa	107	139	0.3353E-01	0.5291E-02	27494
attremh.xy89.1gsa	105	140	0.3364E-01	0.5136E-02	27491
attremh.xy90.1gsa	106	140	0.3404E-01	0.5139E-02	27051
attremh.xy91.1gsa	108	141	0.3432E-01	0.5118E-02	27266
attremh.xy92.1gsa	108	141	0.3432E-01	0.4934E-02	27261
attremh.xy93.1gsa	108	141	0.3428E-01	0.4932E-02	26353
attremh.xy94.1gsa	108	141	0.3397E-01	0.4800E-02	26481
attremh.xy95.1gsa	114	138	0.3513E-01	0.4608E-02	26475
attremh.xy96.1gsa	95	163	0.3674E-01	0.4699E-02	25775
attremh.xy97.1gsa	92	163	0.3957E-01	0.4665E-02	25816
attremh.xy98.1gsa	92	163	0.4171E-01	0.4506E-02	25808
attremh.xy99.1gsa	90	163	0.4435E-01	0.4691E-02	25131
attremh.xy100.1gs	89	163	0.4631E-01	0.4743E-02	25302
attremh.xy101.1gs	89	137	0.4896E-01	0.4621E-02	25295
attremh.xy102.1gs	87	137	0.5281E-01	0.4946E-02	24551
attremh.xy103.1gs	86	137	0.5482E-01	0.4941E-02	24639
attremh.xy104.1gs	89	132	0.5434E-01	0.4853E-02	24633
attremh.xy105.1gs	87	132	0.5687E-01	0.5221E-02	24116
attremh.xy106.1gs	86	132	0.5820E-01	0.5230E-02	24185
attremh.xy107.1gs	86	131	0.5893E-01	0.5169E-02	24177
attremh.xy108.1gs	87	128	0.5984E-01	0.5347E-02	23502
attremh.xy109.1gs	87	128	0.6076E-01	0.5377E-02	23576
attremh.xy110.1gs	93	148	0.6317E-01	0.5339E-02	23568
attremh.xy111.1gs	94	149	0.6582E-01	0.5672E-02	23167
attremh.xy112.1gs	94	149	0.6787E-01	0.5657E-02	23131
attremh.xy113.1gs	94	149	0.6860E-01	0.5594E-02	23125
attremh.xy114.1gs	94	149	0.6801E-01	0.5766E-02	22920
attremh.xy115.1gs	94	149	0.6645E-01	0.5716E-02	22878
attremh.xy116.1gs	94	148	0.6489E-01	0.5624E-02	22872
attremh.xy117.1gs	94	148	0.6243E-01	0.5730E-02	22705
attremh.xy118.1gs	94	148	0.5937E-01	0.5636E-02	22709
attremh.xy119.1gs	101	111	0.5828E-01	0.5513E-02	22707
attremh.xy120.1gs	101	112	0.5802E-01	0.5448E-02	22667
attremh.xy121.1gs	101	112	0.5764E-01	0.5349E-02	22510
attremh.xy122.1gs	102	112	0.5629E-01	0.5194E-02	22509
attremh.xy123.1gs	100	113	0.5619E-01	0.5169E-02	22569
attremh.xy124.1gs	101	112	0.5662E-01	0.5045E-02	22482
attremh.xy125.1gs	100	113	0.5597E-01	0.4890E-02	22482

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy126.1gs	101	112	0.5529E-01	0.4847E-02	22657
attremh.xy127.1gs	99	111	0.5456E-01	0.4747E-02	22544
attremh.xy128.1gs	99	113	0.5267E-01	0.4590E-02	22535
attremh.xy129.1gs	98	113	0.5116E-01	0.4691E-02	22749
attremh.xy130.1gs	96	114	0.4958E-01	0.4622E-02	22759
attremh.xy131.1gs	95	113	0.4839E-01	0.4501E-02	22758
attremh.xy132.1gs	95	111	0.4893E-01	0.4715E-02	23106
attremh.xy133.1gs	80	131	0.4849E-01	0.4674E-02	23135
attremh.xy134.1gs	81	130	0.4886E-01	0.4570E-02	23134
attremh.xy135.1gs	79	132	0.4869E-01	0.4691E-02	23459
attremh.xy136.1gs	79	131	0.4817E-01	0.4634E-02	23488
attremh.xy137.1gs	95	113	0.4748E-01	0.4529E-02	23488
attremh.xy138.1gs	95	114	0.4869E-01	0.4681E-02	23777
attremh.xy139.1gs	95	112	0.4894E-01	0.4624E-02	23800
attremh.xy140.1gs	96	111	0.4946E-01	0.4534E-02	23800
attremh.xy141.1gs	95	112	0.5027E-01	0.4646E-02	24035
attremh.xy142.1gs	96	113	0.5087E-01	0.4579E-02	24054
attremh.xy143.1gs	92	109	0.5151E-01	0.4489E-02	24053
attremh.xy144.1gs	94	111	0.5148E-01	0.4517E-02	24284
attremh.xy145.1gs	94	110	0.5197E-01	0.4444E-02	24304
attremh.xy146.1gs	94	111	0.5176E-01	0.4363E-02	24302
attremh.xy147.1gs	94	111	0.5148E-01	0.4318E-02	24429
attremh.xy148.1gs	93	110	0.5119E-01	0.4267E-02	24446
attremh.xy149.1gs	92	109	0.5111E-01	0.4185E-02	24446
attremh.xy150.1gs	91	108	0.5111E-01	0.4210E-02	24630
attremh.xy151.1gs	90	109	0.5064E-01	0.4143E-02	24650
attremh.xy152.1gs	91	109	0.5051E-01	0.4050E-02	24650
attremh.xy153.1gs	91	109	0.4967E-01	0.4037E-02	24887
attremh.xy154.1gs	90	107	0.4837E-01	0.3947E-02	24893
attremh.xy155.1gs	89	109	0.4694E-01	0.3847E-02	24892
attremh.xy156.1gs	90	109	0.4530E-01	0.3813E-02	25066
attremh.xy157.1gs	90	107	0.4460E-01	0.3717E-02	25070
attremh.xy158.1gs	90	109	0.4398E-01	0.3611E-02	25069
attremh.xy159.1gs	90	106	0.4359E-01	0.3570E-02	25159
attremh.xy160.1gs	90	104	0.4446E-01	0.3466E-02	25165
attremh.xy161.1gs	90	104	0.4400E-01	0.3354E-02	25164
attremh.xy162.1gs	92	105	0.4188E-01	0.3285E-02	25418
attremh.xy163.1gs	92	106	0.4079E-01	0.3170E-02	25461
attremh.xy164.1gs	92	106	0.3963E-01	0.3053E-02	25460
attremh.xy165.1gs	92	106	0.3854E-01	0.2938E-02	25666
attremh.xy166.1gs	92	106	0.3831E-01	0.2831E-02	25682
attremh.xy167.1gs	92	106	0.3823E-01	0.2722E-02	25681
attremh.xy168.1gs	93	102	0.3791E-01	0.2647E-02	25702
attremh.xy169.1gs	93	101	0.3851E-01	0.2563E-02	25675
attremh.xy170.1gs	93	101	0.3812E-01	0.2477E-02	25675
attremh.xy171.1gs	93	101	0.3663E-01	0.2390E-02	25719
attremh.xy172.1gs	93	104	0.3602E-01	0.2327E-02	25725
attremh.xy173.1gs	93	104	0.3440E-01	0.2263E-02	25724
attremh.xy174.1gs	93	101	0.3425E-01	0.2186E-02	25728
attremh.xy175.1gs	92	101	0.3366E-01	0.2164E-02	25573
attremh.xy176.1gs	92	101	0.3347E-01	0.2130E-02	25573
attremh.xy177.1gs	91	101	0.3537E-01	0.2122E-02	25731
attremh.xy178.1gs	91	101	0.3504E-01	0.2115E-02	25539
attremh.xy179.1gs	91	101	0.3422E-01	0.2111E-02	25539
attremh.xy180.1gs	92	99	0.3428E-01	0.2107E-02	25613

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy181.1gs	92	99	0.3376E-01	0.2126E-02	25440
attremh.xy182.1gs	90	101	0.3355E-01	0.2139E-02	25440
attremh.xy183.1gs	90	101	0.3344E-01	0.2184E-02	25634
attremh.xy184.1gs	92	99	0.3375E-01	0.2311E-02	24090
attremh.xy185.1gs	92	99	0.3466E-01	0.2350E-02	24090
attremh.xy186.1gs	92	99	0.3536E-01	0.2451E-02	24449
attremh.xy187.1gs	92	99	0.3609E-01	0.2504E-02	24059
attremh.xy188.1gs	92	99	0.3674E-01	0.2540E-02	24058
attremh.xy189.1gs	68	154	0.3779E-01	0.2638E-02	24462
attremh.xy190.1gs	67	155	0.4000E-01	0.2739E-02	24320
attremh.xy191.1gs	67	155	0.4355E-01	0.2778E-02	24319
attremh.xy192.1gs	67	155	0.4628E-01	0.2898E-02	24624
attremh.xy193.1gs	65	155	0.4927E-01	0.2885E-02	24466
attremh.xy194.1gs	65	155	0.5242E-01	0.2924E-02	24465
attremh.xy195.1gs	65	155	0.5510E-01	0.2919E-02	24506
attremh.xy196.1gs	65	155	0.5815E-01	0.2924E-02	24230
attremh.xy197.1gs	65	155	0.6022E-01	0.2951E-02	24227
attremh.xy198.1gs	67	155	0.6487E-01	0.2980E-02	24295
attremh.xy199.1gs	67	155	0.6686E-01	0.2947E-02	23981
attremh.xy200.1gs	68	156	0.6748E-01	0.2964E-02	23980
attremh.xy201.1gs	67	157	0.6842E-01	0.2897E-02	24143
attremh.xy202.1gs	68	157	0.6821E-01	0.2868E-02	23957
attremh.xy203.1gs	68	157	0.6758E-01	0.2876E-02	23955
attremh.xy204.1gs	68	158	0.6686E-01	0.2883E-02	24126
attremh.xy205.1gs	68	159	0.6570E-01	0.2869E-02	24005
attremh.xy206.1gs	68	158	0.6381E-01	0.2866E-02	24003
attremh.xy207.1gs	68	159	0.6337E-01	0.2756E-02	24157
attremh.xy208.1gs	69	161	0.6217E-01	0.2733E-02	24026
attremh.xy209.1gs	70	161	0.6163E-01	0.2725E-02	24024
attremh.xy210.1gs	70	161	0.5885E-01	0.2677E-02	24278
attremh.xy211.1gs	71	162	0.5719E-01	0.2643E-02	24168
attremh.xy212.1gs	73	162	0.5540E-01	0.2642E-02	24166
attremh.xy213.1gs	72	163	0.5347E-01	0.2607E-02	24614
attremh.xy214.1gs	74	163	0.5368E-01	0.2616E-02	24520
attremh.xy215.1gs	73	163	0.5287E-01	0.2612E-02	24518
attremh.xy216.1gs	74	163	0.5294E-01	0.2645E-02	24864
attremh.xy217.1gs	75	163	0.5063E-01	0.2688E-02	24849
attremh.xy218.1gs	74	163	0.4958E-01	0.2721E-02	24846
attremh.xy219.1gs	74	162	0.4662E-01	0.2663E-02	24915
attremh.xy220.1gs	74	164	0.4514E-01	0.2725E-02	24881
attremh.xy221.1gs	74	163	0.4365E-01	0.2783E-02	24878
attremh.xy222.1gs	69	154	0.4350E-01	0.2767E-02	24804
attremh.xy223.1gs	71	152	0.4584E-01	0.2836E-02	24809
attremh.xy224.1gs	71	153	0.4731E-01	0.2922E-02	24807
attremh.xy225.1gs	71	154	0.4848E-01	0.2907E-02	24854
attremh.xy226.1gs	70	154	0.5038E-01	0.3072E-02	24762
attremh.xy227.1gs	71	154	0.5167E-01	0.3160E-02	24758
attremh.xy228.1gs	71	155	0.5201E-01	0.3231E-02	24952
attremh.xy229.1gs	71	157	0.5302E-01	0.3291E-02	24898
attremh.xy230.1gs	72	156	0.5121E-01	0.3340E-02	24891
attremh.xy231.1gs	72	157	0.5229E-01	0.3338E-02	25024
attremh.xy232.1gs	72	157	0.5040E-01	0.3395E-02	25120
attremh.xy233.1gs	72	157	0.5026E-01	0.3414E-02	25118
attremh.xy234.1gs	72	157	0.4943E-01	0.3435E-02	25827
attremh.xy235.1gs	72	157	0.4778E-01	0.3448E-02	25889

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy236.1gs	72	157	0.4601E-01	0.3416E-02	25885
attremh.xy237.1gs	85	110	0.4444E-01	0.3470E-02	25892
attremh.xy238.1gs	86	112	0.4400E-01	0.3427E-02	25953
attremh.xy239.1gs	86	111	0.4345E-01	0.3381E-02	25950
attremh.xy240.1gs	86	109	0.4243E-01	0.3424E-02	26036
attremh.xy241.1gs	85	110	0.4205E-01	0.3395E-02	26107
attremh.xy242.1gs	86	109	0.4118E-01	0.3382E-02	26101
attremh.xy243.1gs	86	109	0.4158E-01	0.3458E-02	26134
attremh.xy244.1gs	83	110	0.4219E-01	0.3501E-02	26141
attremh.xy245.1gs	82	113	0.4276E-01	0.3524E-02	26134
attremh.xy246.1gs	81	110	0.4449E-01	0.3681E-02	26115
attremh.xy247.1gs	82	110	0.4487E-01	0.3763E-02	26092
attremh.xy248.1gs	82	110	0.4540E-01	0.3844E-02	26085
attremh.xy249.1gs	83	112	0.4416E-01	0.3884E-02	25864
attremh.xy250.1gs	80	115	0.4505E-01	0.4013E-02	25926
attremh.xy251.1gs	80	115	0.4526E-01	0.4127E-02	25922
attremh.xy252.1gs	80	115	0.4557E-01	0.4222E-02	25903
attremh.xy253.1gs	80	115	0.4639E-01	0.4324E-02	25892
attremh.xy254.1gs	78	116	0.4605E-01	0.4436E-02	25887
attremh.xy255.1gs	78	116	0.4652E-01	0.4505E-02	25719
attremh.xy256.1gs	78	116	0.4707E-01	0.4612E-02	25696
attremh.xy257.1gs	78	116	0.4808E-01	0.4705E-02	25689
attremh.xy258.1gs	80	116	0.4740E-01	0.4674E-02	25426
attremh.xy259.1gs	80	118	0.4716E-01	0.4748E-02	25376
attremh.xy260.1gs	81	113	0.4822E-01	0.4795E-02	25369
attremh.xy261.1gs	81	116	0.4792E-01	0.4656E-02	24997
attremh.xy262.1gs	82	116	0.4958E-01	0.4710E-02	24988
attremh.xy263.1gs	83	113	0.5059E-01	0.4740E-02	24986
attremh.xy264.1gs	86	114	0.5069E-01	0.4486E-02	24559
attremh.xy265.1gs	83	116	0.5160E-01	0.4535E-02	24550
attremh.xy266.1gs	84	113	0.5364E-01	0.4578E-02	24541
attremh.xy267.1gs	86	113	0.5166E-01	0.4315E-02	23892
attremh.xy268.1gs	95	107	0.5244E-01	0.4419E-02	23889
attremh.xy269.1gs	92	108	0.5284E-01	0.4497E-02	23887
attremh.xy270.1gs	89	113	0.5197E-01	0.4282E-02	23474
attremh.xy271.1gs	91	113	0.5281E-01	0.4383E-02	23465
attremh.xy272.1gs	89	114	0.5389E-01	0.4485E-02	23454
attremh.xy273.1gs	93	113	0.5187E-01	0.4193E-02	22677
attremh.xy274.1gs	92	113	0.5177E-01	0.4344E-02	22662
attremh.xy275.1gs	92	113	0.5367E-01	0.4474E-02	22653
attremh.xy276.1gs	96	112	0.5004E-01	0.4370E-02	22053
attremh.xy277.1gs	96	110	0.4953E-01	0.4491E-02	22053
attremh.xy278.1gs	92	116	0.5092E-01	0.4588E-02	22047
attremh.xy279.1gs	92	119	0.4574E-01	0.4354E-02	21375
attremh.xy280.1gs	96	116	0.4589E-01	0.4485E-02	21399
attremh.xy281.1gs	90	123	0.4559E-01	0.4589E-02	21391
attremh.xy282.1gs	96	116	0.4398E-01	0.4432E-02	20898
attremh.xy283.1gs	92	122	0.4420E-01	0.4542E-02	20898
attremh.xy284.1gs	98	114	0.4418E-01	0.4620E-02	20888
attremh.xy285.1gs	96	122	0.4051E-01	0.4352E-02	20117
attremh.xy286.1gs	98	116	0.4117E-01	0.4434E-02	20102
attremh.xy287.1gs	98	117	0.4130E-01	0.4510E-02	20089
attremh.xy288.1gs	99	120	0.3863E-01	0.4234E-02	19382
attremh.xy289.1gs	99	119	0.3931E-01	0.4329E-02	19382
attremh.xy290.1gs	99	120	0.3985E-01	0.4399E-02	19370

Name of Slice Data File	Peak SAR x and y coordinates		Peak SAR (W/kg)	Avg. SAR (W/kg)	Voxels in tissue
attremh.xy291.1gs	101	119	0.3720E-01	0.4241E-02	18456
attremh.xy292.1gs	101	119	0.3804E-01	0.4346E-02	18438
attremh.xy293.1gs	101	121	0.3750E-01	0.4425E-02	18426
attremh.xy294.1gs	104	119	0.3501E-01	0.4173E-02	17460
attremh.xy295.1gs	104	122	0.3496E-01	0.4292E-02	17460
attremh.xy296.1gs	104	120	0.3505E-01	0.4392E-02	17448
attremh.xy297.1gs	105	124	0.3229E-01	0.4122E-02	16467
attremh.xy298.1gs	105	122	0.3197E-01	0.4254E-02	16467
attremh.xy299.1gs	104	125	0.3257E-01	0.4363E-02	16454
attremh.xy300.1gs	107	122	0.2979E-01	0.4135E-02	15279
attremh.xy301.1gs	107	122	0.2977E-01	0.4289E-02	15279
attremh.xy302.1gs	107	125	0.2907E-01	0.4408E-02	15267
attremh.xy303.1gs	111	125	0.2721E-01	0.4131E-02	14031
attremh.xy304.1gs	110	125	0.2715E-01	0.4281E-02	14016
attremh.xy305.1gs	112	125	0.2726E-01	0.4398E-02	14005
attremh.xy306.1gs	114	126	0.2504E-01	0.4124E-02	12744
attremh.xy307.1gs	114	127	0.2471E-01	0.4266E-02	12744
attremh.xy308.1gs	114	125	0.2474E-01	0.4376E-02	12734
attremh.xy309.1gs	110	172	0.2267E-01	0.4141E-02	11535
attremh.xy310.1gs	110	172	0.2262E-01	0.4273E-02	11535
attremh.xy311.1gs	110	166	0.2269E-01	0.4377E-02	11526
attremh.xy312.1gs	113	163	0.2319E-01	0.4050E-02	10392
attremh.xy313.1gs	114	163	0.2394E-01	0.4184E-02	10392
attremh.xy314.1gs	113	161	0.2415E-01	0.4338E-02	10383
attremh.xy315.1gs	116	162	0.2352E-01	0.4130E-02	9225
attremh.xy316.1gs	114	159	0.2397E-01	0.4318E-02	9183
attremh.xy317.1gs	115	158	0.2382E-01	0.4531E-02	9174
attremh.xy318.1gs	116	158	0.2224E-01	0.4411E-02	8076
attremh.xy319.1gs	116	158	0.2193E-01	0.4668E-02	8033
attremh.xy320.1gs	116	158	0.2084E-01	0.4886E-02	8025
attremh.xy321.1gs	118	162	0.2024E-01	0.4733E-02	6974
attremh.xy322.1gs	126	160	0.1981E-01	0.4963E-02	6672
attremh.xy323.1gs	124	161	0.2101E-01	0.5186E-02	6665
attremh.xy324.1gs	125	158	0.2148E-01	0.4694E-02	5390
attremh.xy325.1gs	131	158	0.2010E-01	0.4793E-02	5340
attremh.xy326.1gs	131	158	0.2144E-01	0.5024E-02	5333
attremh.xy327.1gs	137	157	0.1732E-01	0.4426E-02	4304
attremh.xy328.1gs	137	157	0.1807E-01	0.4641E-02	4284
attremh.xy329.1gs	137	157	0.2002E-01	0.5032E-02	4275
attremh.xy330.1gs	143	163	0.1578E-01	0.4756E-02	3421
attremh.xy331.1gs	143	163	0.1664E-01	0.5099E-02	3375
attremh.xy332.1gs	143	161	0.1695E-01	0.5646E-02	3371
attremh.xy333.1gs	146	157	0.1456E-01	0.5579E-02	2744
attremh.xy334.1gs	146	157	0.1476E-01	0.6104E-02	2568
attremh.xy335.1gs	146	157	0.1476E-01	0.6389E-02	2565
attremh.xy336.1gs	150	157	0.1272E-01	0.6403E-02	2134
attremh.xy337.1gs	152	167	0.1218E-01	0.6640E-02	1652
attremh.xy338.1gs	153	160	0.1215E-01	0.6972E-02	1650
attremh.xy339.1gs	152	167	0.1179E-01	0.6499E-02	908
attremh.xy340.1gs	167	157	0.1132E-01	0.7071E-02	646
attremh.xy341.1gs	167	157	0.1211E-01	0.7356E-02	641
attremh.xy342.1gs	186	148	0.6359E-02	0.5131E-02	58
Location and values for peak and average SAR for total volume of Exposed Tissue					
attremh.xy113.sar	94	149	0.6860E-01	0.3950E-02	5694630

Figure 3.6 illustrates the orientation of the REMCOM head model with respect to the antenna in the sagittal or xz plane at y = 154 mm from the origin of the rectangular coordinate system at the lower-front-left corner of the fdtd mesh. The horizontal black lines, A through K denotes the horizontal xy planes where the SAR data was plotted and printed. However, SAR data were calculated for all of the 264, 1-mm thick horizontal xy slices as well as for the vertical slices denoted by L through N in the sagittal xz plane of the simulated head tissue illustrated in Figure 3.7.

Figure 7.1 illustrates the SAR distribution in xz planes through the head corresponding to the vertical slices L (through the center of the left row of antenna patches), M (through the center of the array of patches) and N (through the right row of patches) defined in Figure 3.7. Note that the maximum SAR in the head slice color plots varies from 0.177 to 0.190 W/kg very close to the maximum 0.172 W/kg observed on the equivalent plots of the homogeneous head model.

Figures 7.2 and 7.3 respectively illustrate the SAR distribution in the horizontal xy planes at slices labeled as A through E and F through K as denoted in Figure 3.6. The peak SAR for the entire head model, 0.439 W/kg occurs in the scan through the slice denoted as scan G or slice 213 in Figure 7.2. The white arrow points to the FDTD location of the FDTD cell experiencing the highest SAR. Figure 7.4 compares the color plot (left) of the peak SAR containing the highest value to the color plot (right) of the 1-gram average SAR for the same location. With the 1 gram averaging the maximum SAR at the position of the same cell is 0.0535 W/kg which is 14.8 dB below the FCC MPL.

Figures 7.5 and 7.6 illustrate the respective color plots of the SAR distribution in the xy planes denoted by A through E and F through K as identified in Figure 3.6. As for the case of the homogeneous head, the legend for these plots is set to allow the color red to represent all SARs at or greater than the value 1.6 W/kg allowed by the FCC MPL and the maximum value of the SAR for each plot is shown in the text below the plots. The maximum 1-gram average for the entire head model, 0.06860 W/kg occurs through the slice denoted as D in Figure 7.5 at the location of the black plus sign. The dynamic range of the 1-gram average distribution based on 0 dB = 0.0686 is shown in Figure 7.6.