ENGINEERING TEST REPORT

UHF-FM Hand Held Transceiver
Model No.: IC-F21-1

Tested For

ICOM Incorporated
1-1-32, Kamininami
Hirano-Ku, Osaka
Japan, 547-0003

In Accordance With

SAR (Specific Absorption Rate) Requirements
Using Guidelines Established in IEEE C95.1-1991,
FCC OET Bulletin 65 (Supplement C),
Industry Canada RSS-102(Issue 1) and
ACA Radiocommunications (Electromagnetic Radiation – Human Exposure)
Amendment Standard 2000 (No. 1)

UltraTech's File No.: ICOM-033-SAR

This Test report is Issued under the Authority of Tri M. Luu, Professional Engineer, Vice President of Engineering UltraTech Group of Labs Date: December 07, 2001	
Report Prepared by: JaeWook Choi Issued Date: December 7, 2001	Tested by: JaeWook Choi Test Dates: November 28, 2001

The results in this Test Report apply only to the sample(s) tested, which has been randomly selected.

UltraTech

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	SAR (Specific Absorption Rate) Requirements IEEE C95.1-1991, FCC OET Bulletin 65 (Supplement C) Industry Canada RSS-102 (Issue 1). ACA Radiocommunications (Electromagnetic Radiation – Human Exposure), Amendment Standard 2000 (No. 1)
Title:	Safety Levels with respect to human exposure to Radio Frequency Electromagnetic Fields Guideline for Evaluating the Environmental Effects of Radio Frequency Radiation
Purpose of Test:	To verify compliance with Federal regulated SAR requirements in Canada and the US.
Method of Measurements:	IEEE C95.1-1991, FCC OET Bulletin 65 (Supplement C) and Industry Canada RSS-102 (Issue 1)
Exposure Category:	[ ] General population, uncontrolled exposure **[X] Occupational, controlled exposure**

1.2. REFERENCES

The methods and procedures used for the measurements contained in this report are details in the following reference standards:

Publications	Year	Title
IEEE Std. 1528-2001 Draft	2001	Draft Recommended practice for determining the Peak Spatial-Average Specific Absorption rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.
Industry Canada RSS102	1999	"Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields"
ACA	2000	ACA Radiocommunications (Electromagnetic Radiation – Human Exposure) Amendment Standard 2000 (No. 1)
NCRP Report No.86	1986	"Biological Effects and Exposure Criteria for radio Frequency Electromagnetic Fields"
FCC OET Bulletin 65	1997	"Evaluating Compliance with FCC Guidelines for Human Exposure to radio Frequency Fields"
ANSI/IEEE C95.3	1992	"Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave"
ANSI/IEEE C95.1	1992	"Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300GHz"
AS/NZS 2722.1	1998	Interim Australian/New Zealand Standard. "Radiofrequency fields, Part 1:Maximum exposure levels – 3kHz to 300GHz "

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT AND MANUFACTURER INFORMATION

APPLICANT	
Name:	ICOM Incorporated
Address:	1-1-32, Kamininami Hirano-Ku, Osaka Japan, 547-0003
Contact Person:	Mr. Takashi Aoki Phone #: +81-66-793-5302

MANUFACTURER	
Name:	ICOM Incorporated
Address:	1-1-32, Kamininami Hirano-Ku, Osaka Japan, 547-0003
Contact Person:	Mr. Takashi Aoki Phone #: +81-66-793-5302

2.2. DEVICE UNDER TEST (EUT) DESCRIPTION

The following is the information provided by the applicant.

Trade Name:	ICOM Inc.
Type/Model Number:	IC-F21-1
Serial Number:	N/A
Type of Equipment:	UHF-FM Hand Held Transceiver
Frequency of Operation:	400 – 430 MHz
Rated RF Power:	4 W (Conducted)
Modulation Employed:	FM
Antenna Type:	Monopole
External Power Supply:	Ni-Cd Battery Pack (M/N: BP-209, 7.2 V, 1100 mAh) Ni-MH Battery Pack (M/N: BP-210, 7.2 V, 1650 mAh) Ni-Cd Battery Pack (M/N: BP-222, 7.2 V, 600 mAh)
Primary User Functions of EUT:	Licensed Non-Broadcast Transmitter Held to Face

2.3. LIST OF EUT'S ACCESSORIES

- Battery Charger (M/N: BC-119)
- Power Adapter (M/N: BC-123A)
- Belt Clip (M/N: MB-68) and Rotary Belt Clip (M/N: MB-87)
- Headset (M/N : HS-51)

2.4. SPECIAL CHANGES ON THE EUT'S HARDWARE/SOFTWARE FOR TESTING PURPOSES

None

2.5. ANCILLARY EQUIPMENT

None

2.6. GENERAL TEST CONFIGURATIONS

2.6.1. Equipment Configuration

Power and signal distribution, grounding, interconnecting cabling and physical placement of equipment of a test system shall simulate the typical application and usage in so far as is practicable, and shall be in accordance with the relevant product specifications of the manufacturer.

The configuration that tends to maximize the EUT's emission or minimize its immunity is not usually intuitively obvious and in most instances selection will involve some trial and error testing. For example, interface cables may be moved or equipment re-orientated during initial stages of testing and the effects on the results observed.

Only configurations within the range of positions likely to occur in normal use need to be considered.

The configuration selected shall be fully detailed and documented in the test report, together with the justification for selecting that particular configuration.

2.6.2. Exercising Equipment

The exercising equipment and other auxiliary equipment shall be sufficiently decoupled from the EUT so that the performance of such equipment does not significantly influence the test results.

2.7. SPECIFIC OPERATING CONDITIONS

Not specified.

2.8. BLOCK DIAGRAM OF TEST SETUP

The EUT was configured as normal intended use. The following block diagram shows a representative equipment arrangement during tests:

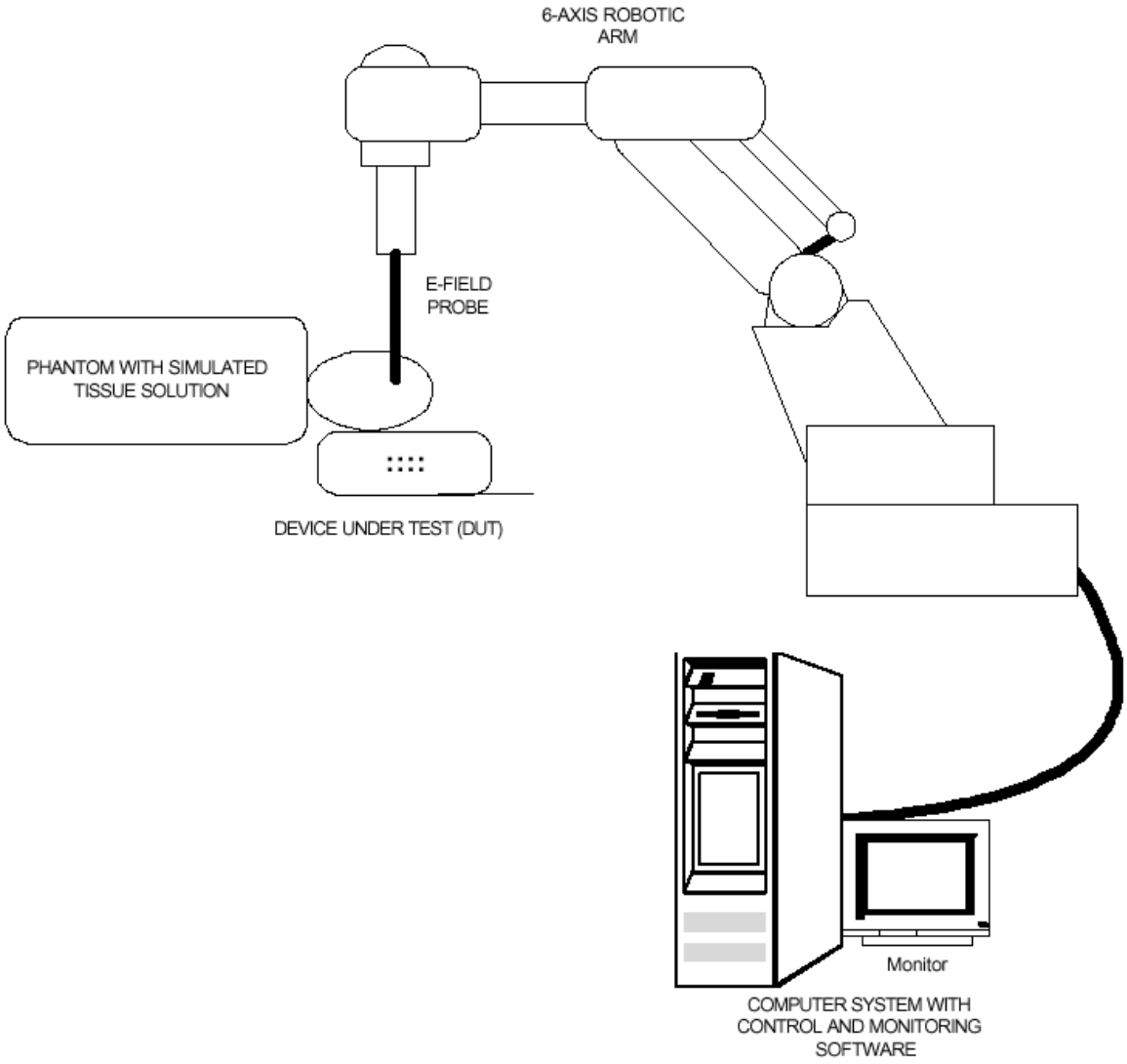


EXHIBIT 3. SUMMARY OF TEST RESULTS

3.1. LOCATION OF TESTS

All of the measurements described in this report were performed at UltraTech Group of Labs located at:

3000 Bristol Circle, in the city of Oakville, Province of Ontario, Canada.

All measurements were performed in UltraTech's shielded chamber, 24' x 16' x 8'.

3.2. APPLICABILITY & SUMMARY OF SAR RESULTS

The maximum peak spatial - average SAR measured was found to be **5.870** W/Kg **(50% Duty Cycle)**

SAR Limits	Test Requirements	Compliance (Yes/No)
General population/Uncontrolled exposure 0.08W/kg whole body average and spatial peak SAR of 1.6W/kg, averaged over 1gram of tissue Hands, wrist, feet and ankles have a peak SAR not to exceed 4 W/kg, averaged over 10 grams of tissue.	Requirements using guidelines established in IEEE C95.1-1991 FCC OET Bulletin 65 (Supplement C) Industry Canada RSS-102 (Issue 1). ACA Radiocommunications (Electromagnetic Radiation – Human Exposure) Amendment Standard 2000 (No. 1)	N/A
Occupational/Controlled Exposure 0.4W/kg whole body average and spatial peak SAR of 8W/kg, averaged over 1gram of tissue Hands, wrist, feet and ankles have a peak SAR not to exceed 20 W/kg, averaged over 10 grams of tissue.	Requirements using guidelines established in IEEE C95.1-1991 FCC OET Bulletin 65 (Supplement C), Industry Canada RSS-102 (Issue 1) ACA Radiocommunications (Electromagnetic Radiation – Human Exposure) Amendment Standard 2000 (No. 1)	Yes

EXHIBIT 4. MEASUREMENTS, EXAMINATIONS & TEST DATA

4.1. TEST SETUP

EUT Information		**Condition**	
Radio Type	UHF-FM Hand Held Transceiver	Robot Type	6 Axis
Model Number	IC-F21-1	Scan Type	SAR
Serial Number	N/A	Measured Field	E
Frequency Band (MHz)	400 - 430	Phantom Type	Flat phantom (L70×W40×H20, 2mm Base)
Frequency Tested (MHz)	400.05, 415.05, 429.95	Phantom Position	Head Front, Body-Worn
Nominal Output Power (W)	4 W (Conducted)	Room Temperature	22.5 ± 1 °C
Antenna Type	Fixed Monopole	Room Humidity	35%
Signal Type	FM	Tissue Temperature	23 ± 1 °C
Duty Cycle	50 %*		

Type of Tissue	**Muscle**	**Brain**
Target Frequency (MHz)	450	450
Target Dielectric Constant	56.70	43.50
Target Conductivity (S/m)	0.94	0.87
Composition (by weight)	DI Water – 36,365.0g (51.76%) Sugar – 32,353.3g (46.05%) Salt – 1,338.1g (1.90%) HEC – 150.0g (0.21%) Bactericide – 50.0g (0.07%)	DI Water – 25,649.6.0g (38.91%) Sugar – 37,171.2g (56.38%) Salt – 2,757.0g (4.18%) HEC – 223.4g (0.34%) Bactericide – 125.4g (0.19%)
Measured Dielectric Constant	56.84	42.14
Measured Conductivity (S/m)	0.92	0.91
Probe Name	UT-ETR-0200-1	UT-ETR-0200-1
Probe Orientation	Isotropic	Isotropic
Probe Offset (mm)	2.25	2.25
Sensor Factor	10.8	10.8
Conversion Factor	0.6425	0.4295
Calibration Date (MM/DD/YY)	11/29/2001	11/27/2001

* EUT is transmitting with 100% duty cycle but **50% duty factor** can only be applied for truly PTT device, that is using a mechanical switch and the device is designed for PTT that does not have feasibility to be connected to wired lines through an operator.

4.2. PHOTOGRAPH OF EUT

< Front View >

< Rear View >

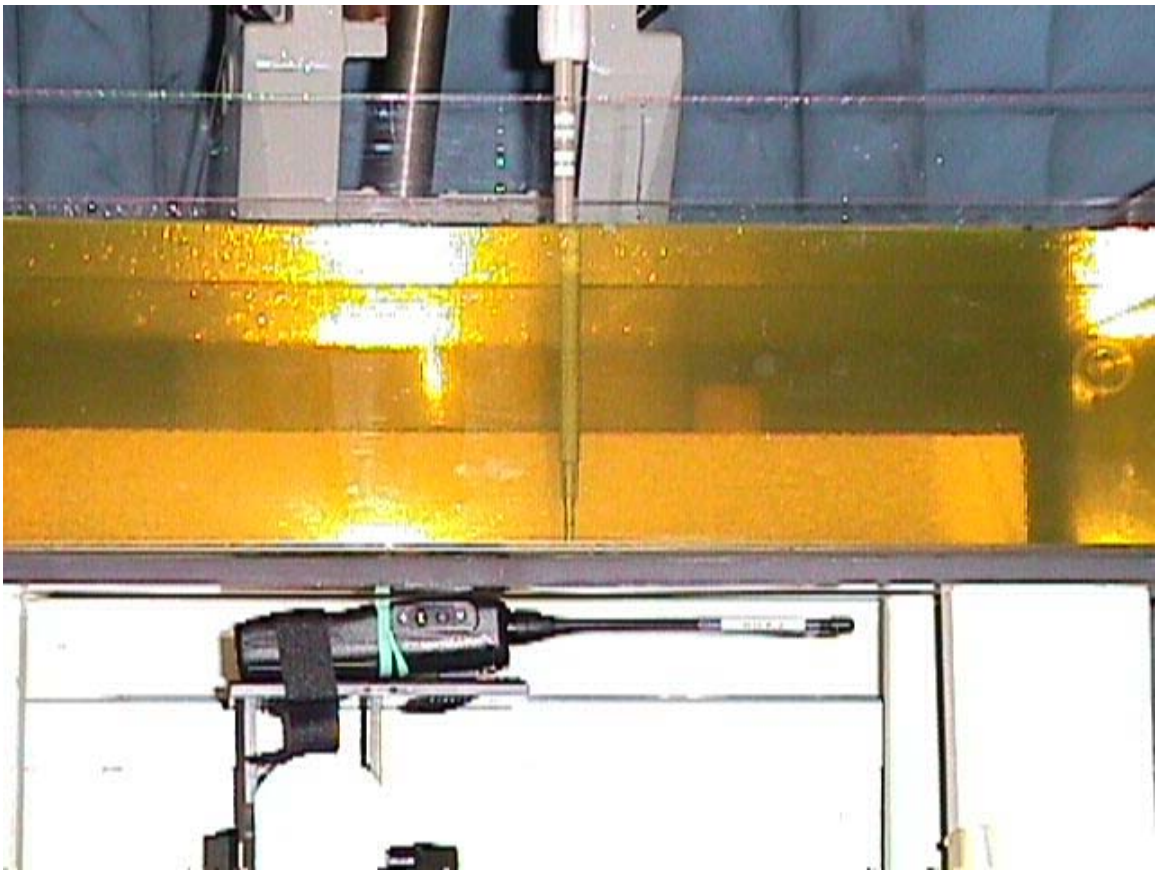
< Rechargeable Battery Packs - M/N: BP-209(left), BP-210(center), BP-222(right) >

< Belt Clip - M/N: MB-68(left) and Alligator Belt Clip -M/N: MB-74(right) >

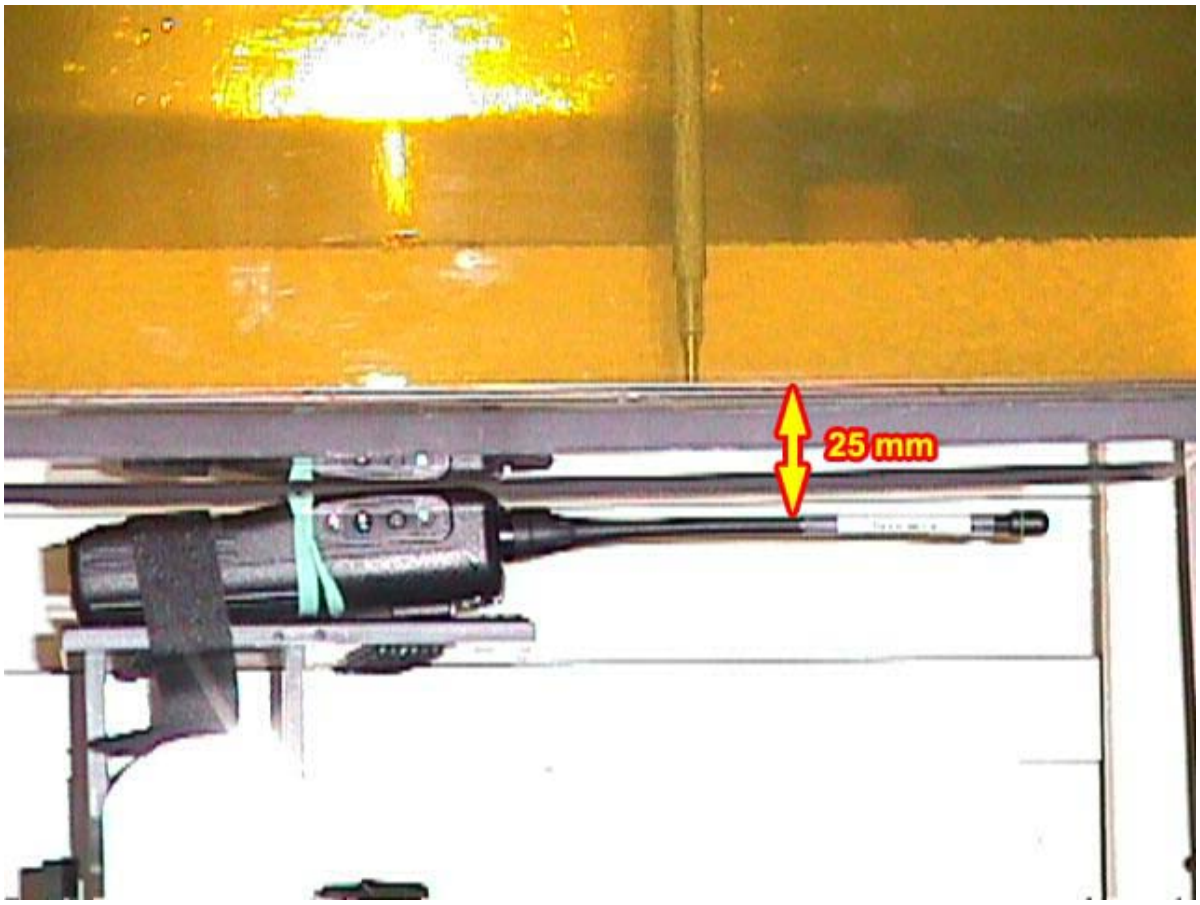
< Battery Charger - M/N: BC-119 and Power Adapter - M/N: BC-123A >

< Headset – M/N: HS-51 >

4.3. PHOTOGRAPHS OF EUT POSITION (HEAD FRONT)

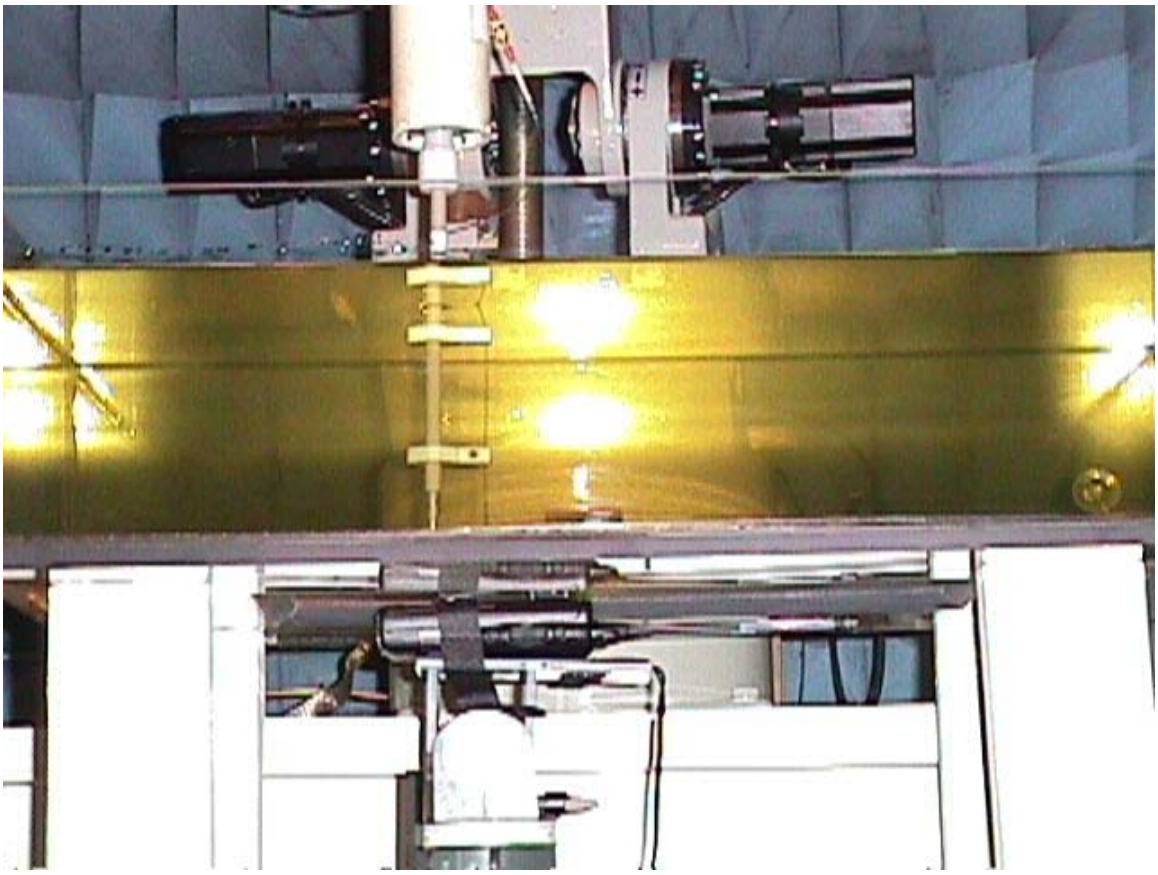


< Head front – Overview >

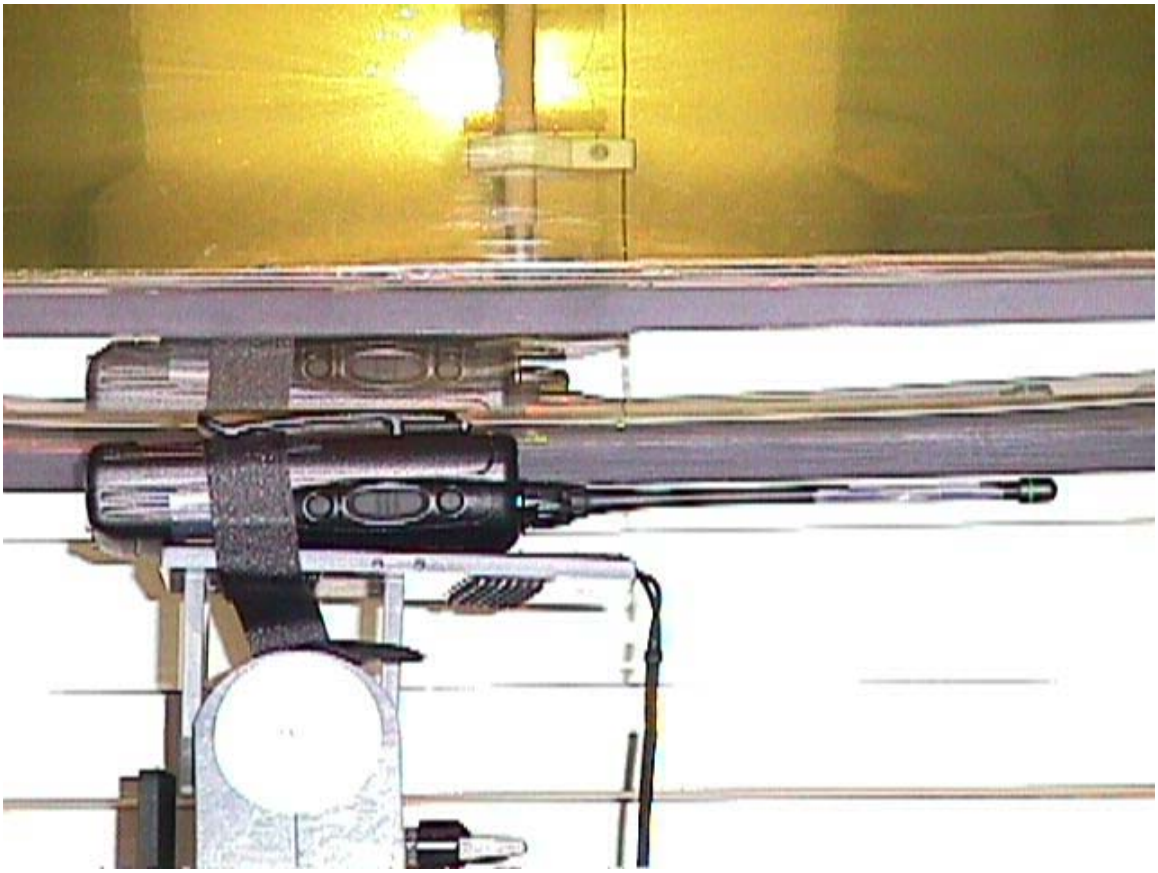


< Head front – Close-up View >

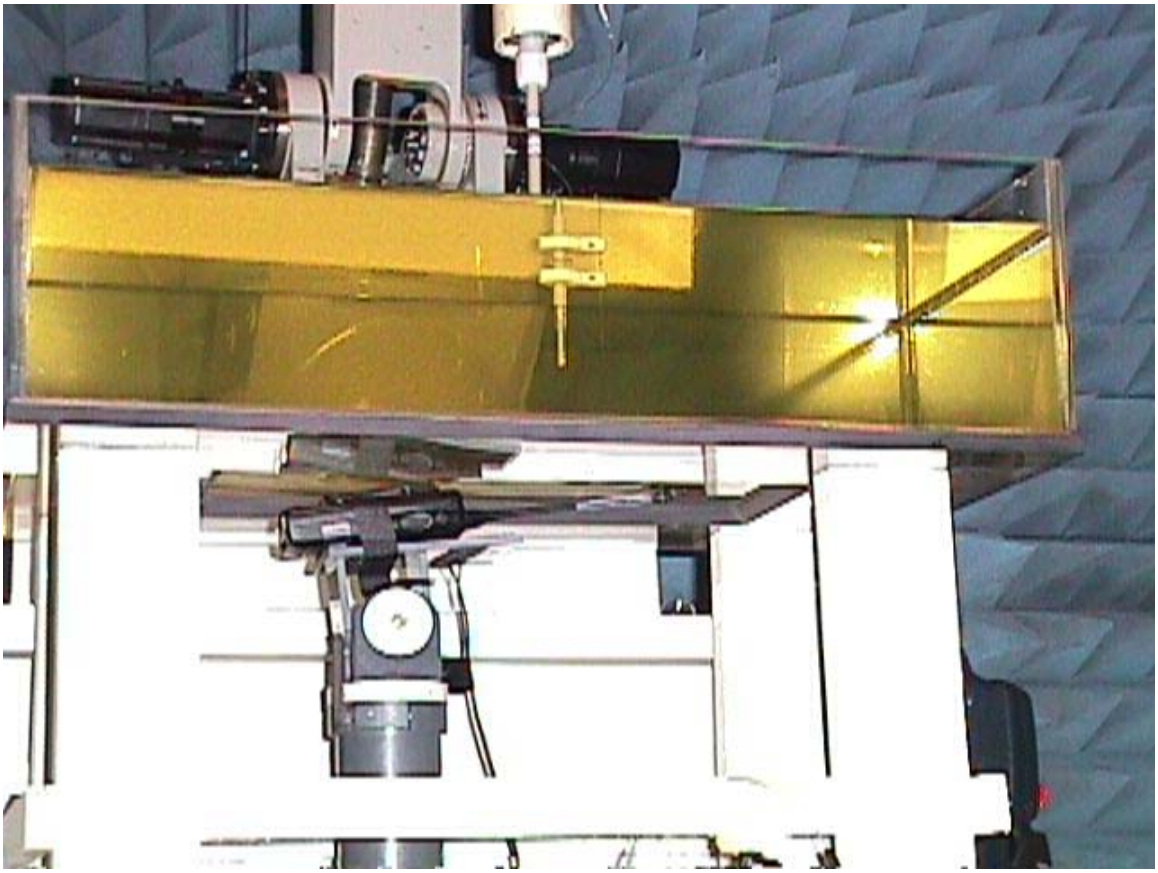
4.4. PHOTOGRAPHS OF EUT POSITION (BODY-WORN)



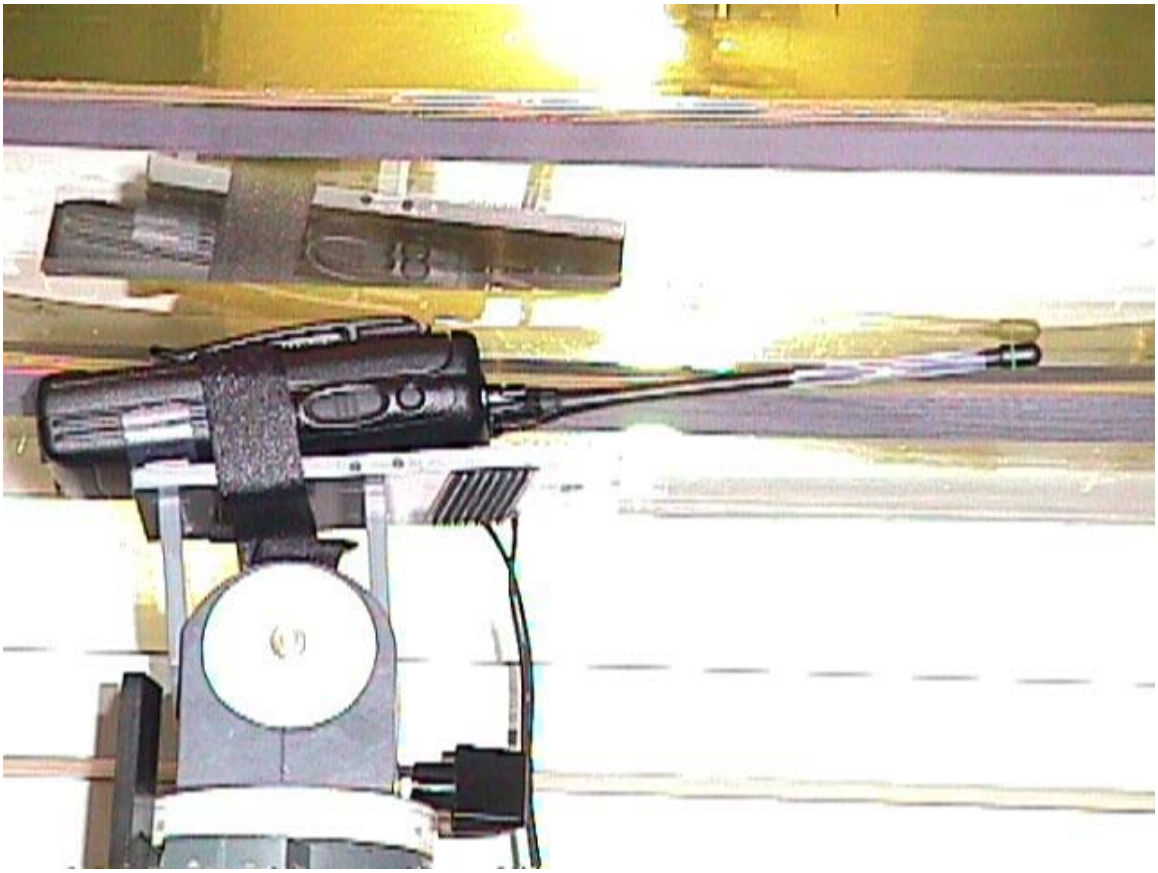
< The EUT parallel to the phantom with the belt clip(M/N: MB-68) and headset(M/N: HS-51) – Overview >



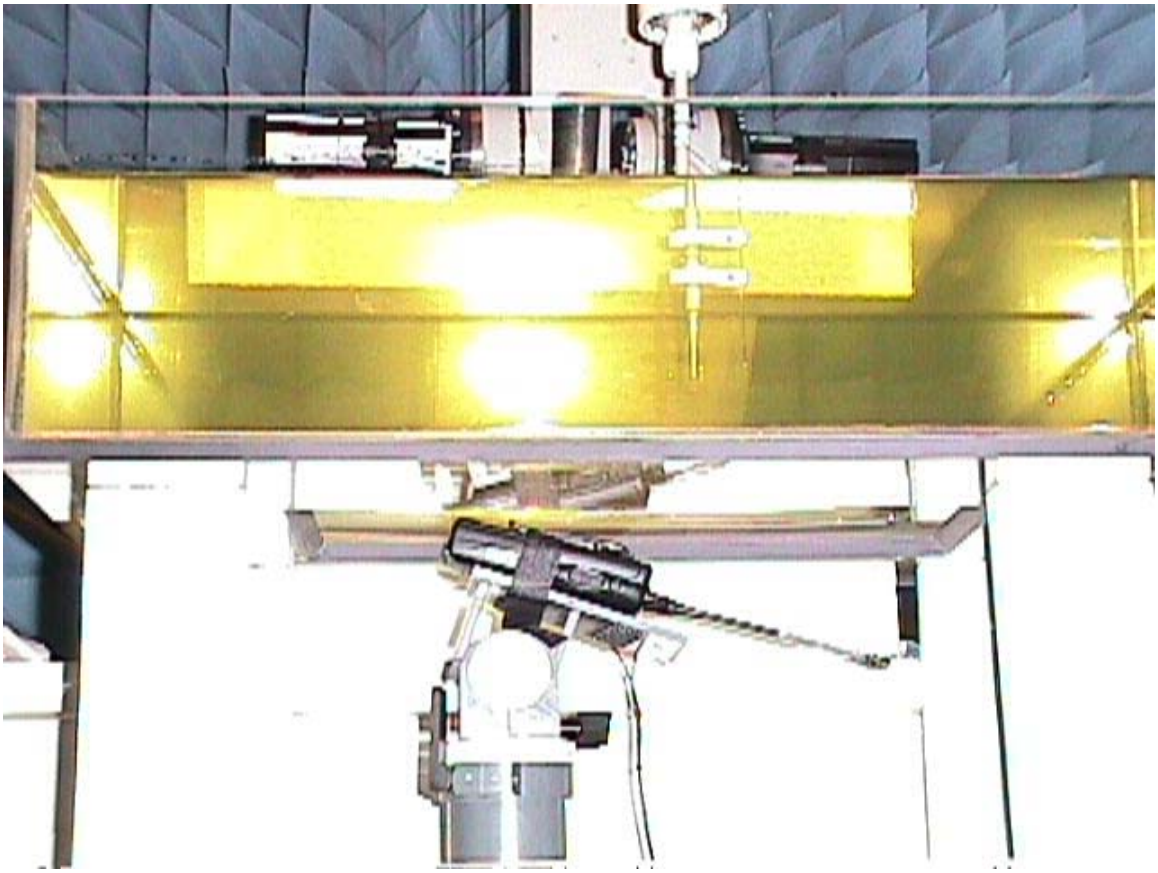
< The EUT parallel to the phantom with the belt clip(M/N: MB-68) and headset(M/N: HS-51) – Close-up View >



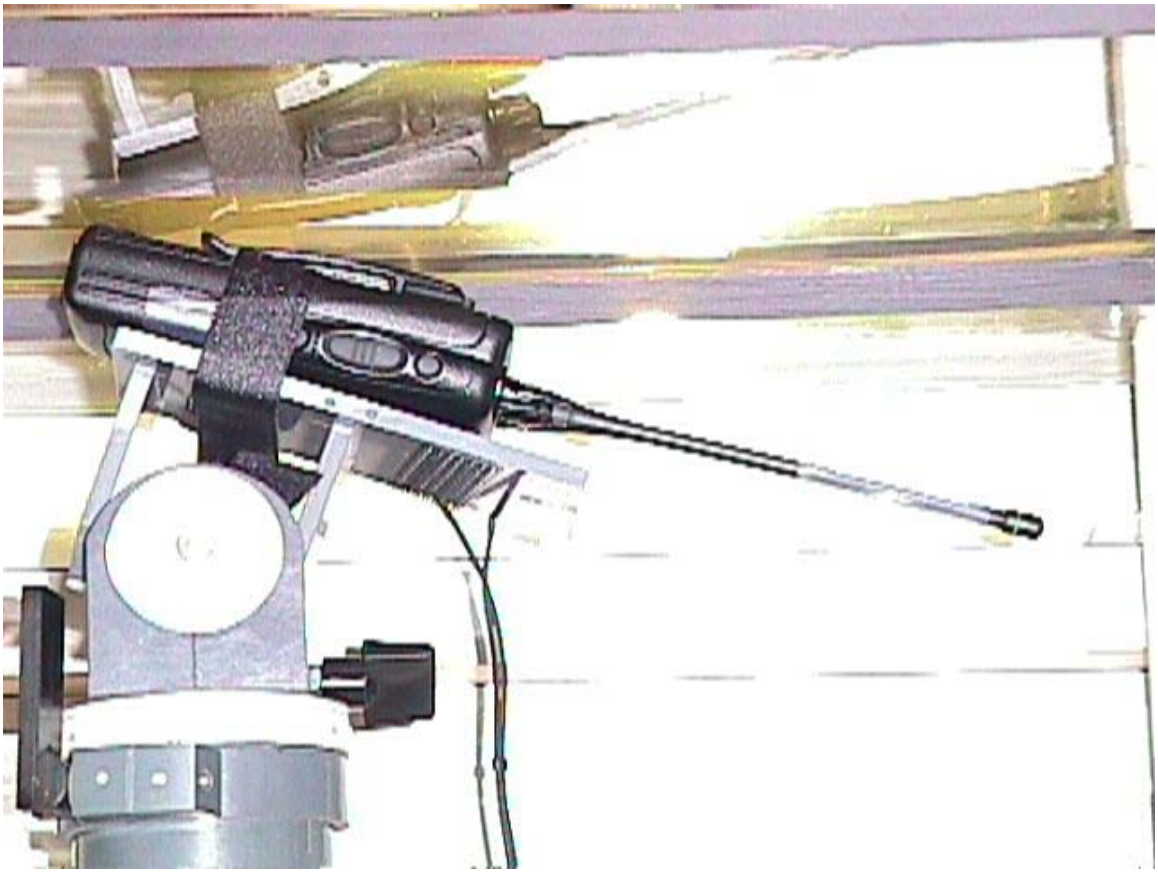
< The tip of the antenna in contact with the phantom with the belt clip(M/N: MB-68) and headset(M/N: HS-51) – Overview >



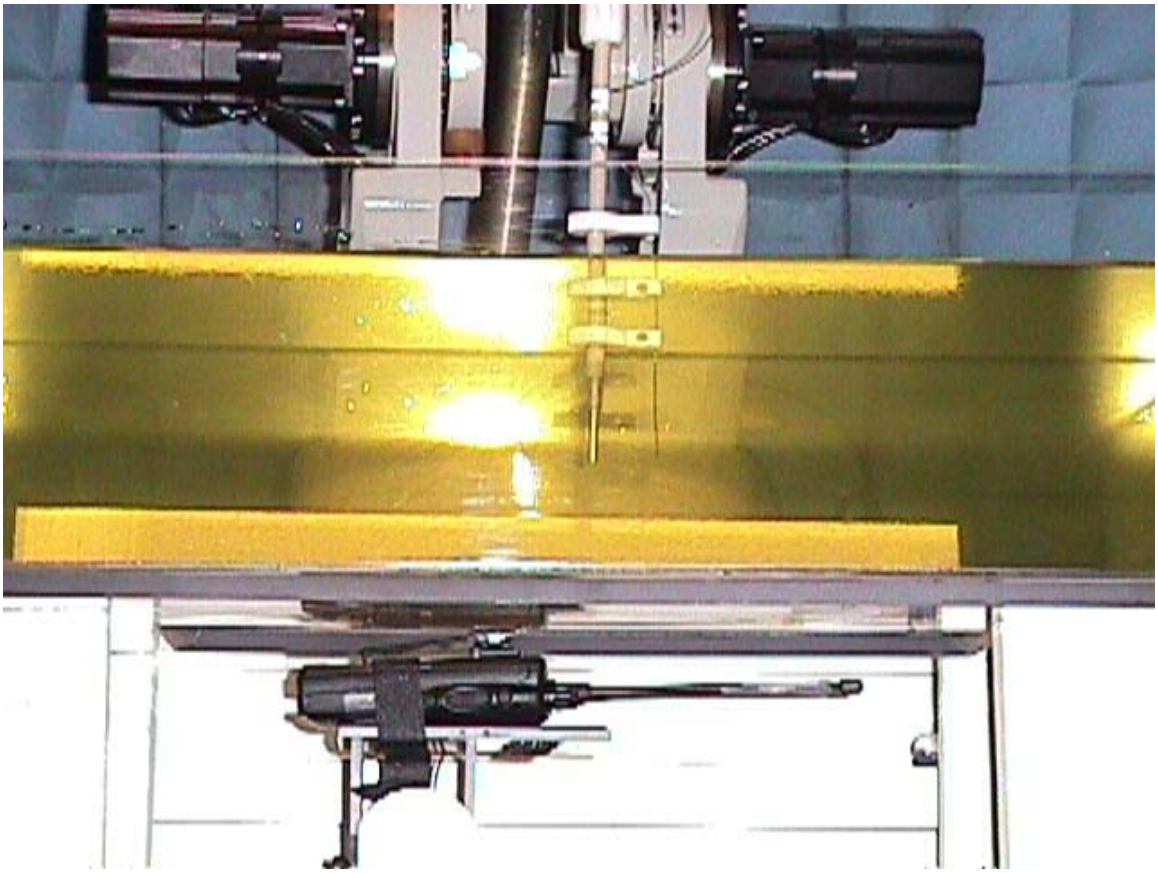
< The tip of the antenna in contact with the phantom with the belt clip(M/N: MB-68) and headset(M/N: HS-51) – Close-up View >



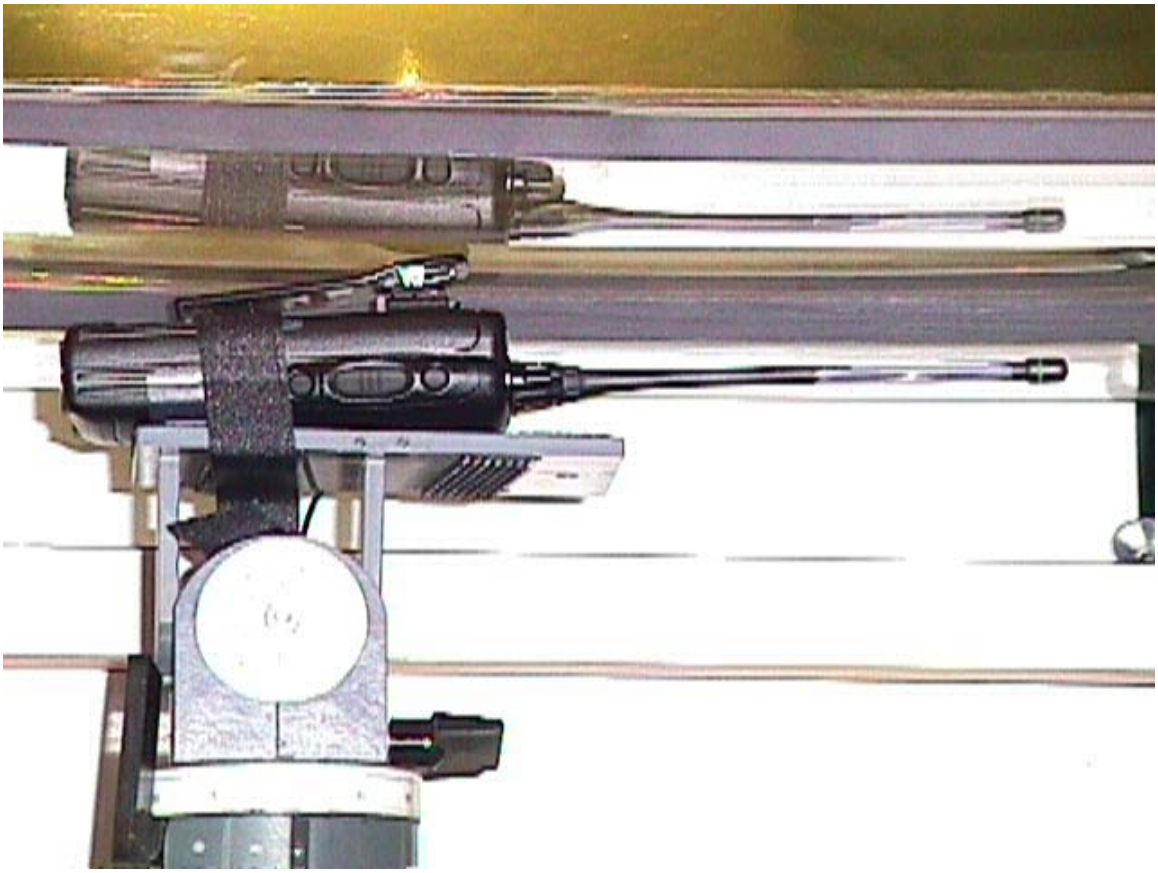
< The bottom of the EUT in contact with the phantom with the belt clip(M/N: MB-68) and headset(M/N: HS-51) – Overview >



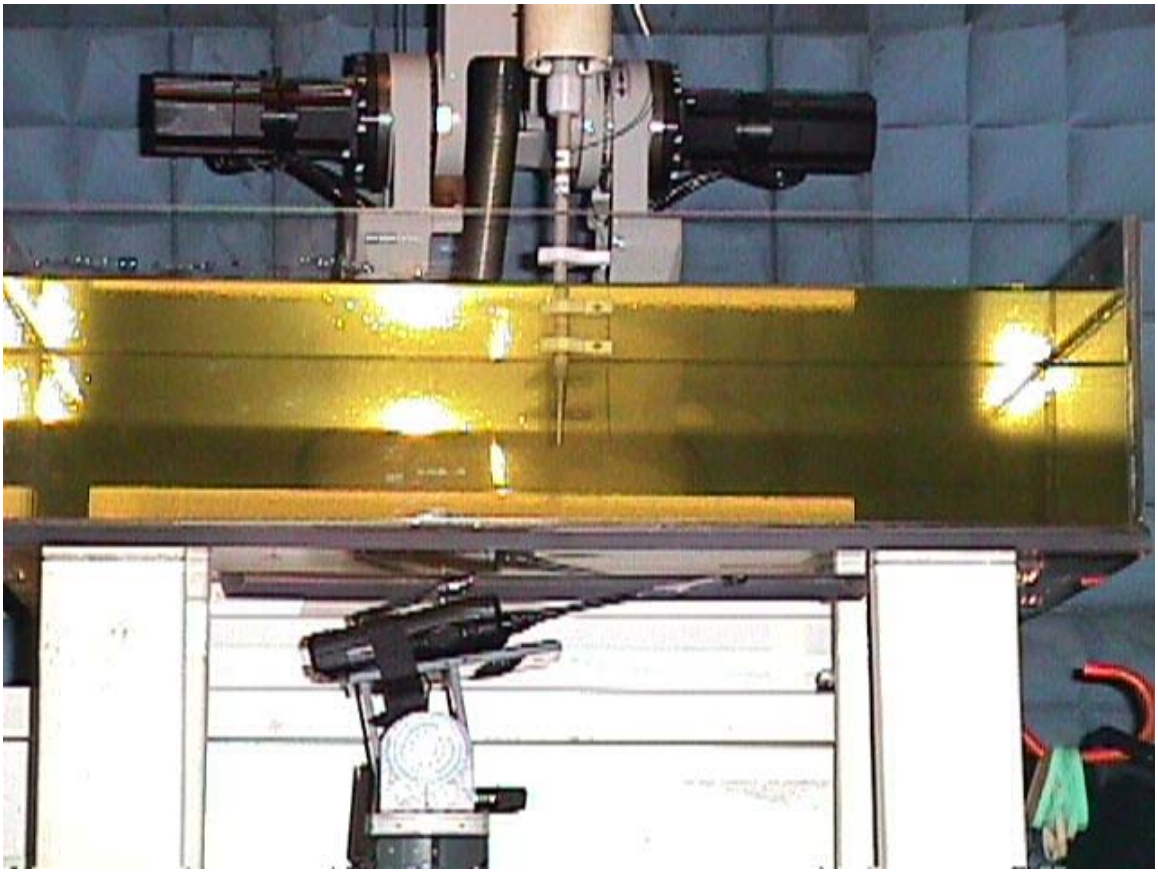
< The bottom of the EUT in contact with the phantom with the belt clip(M/N: MB-68) and headset(M/N: HS-51) – Close-up View >



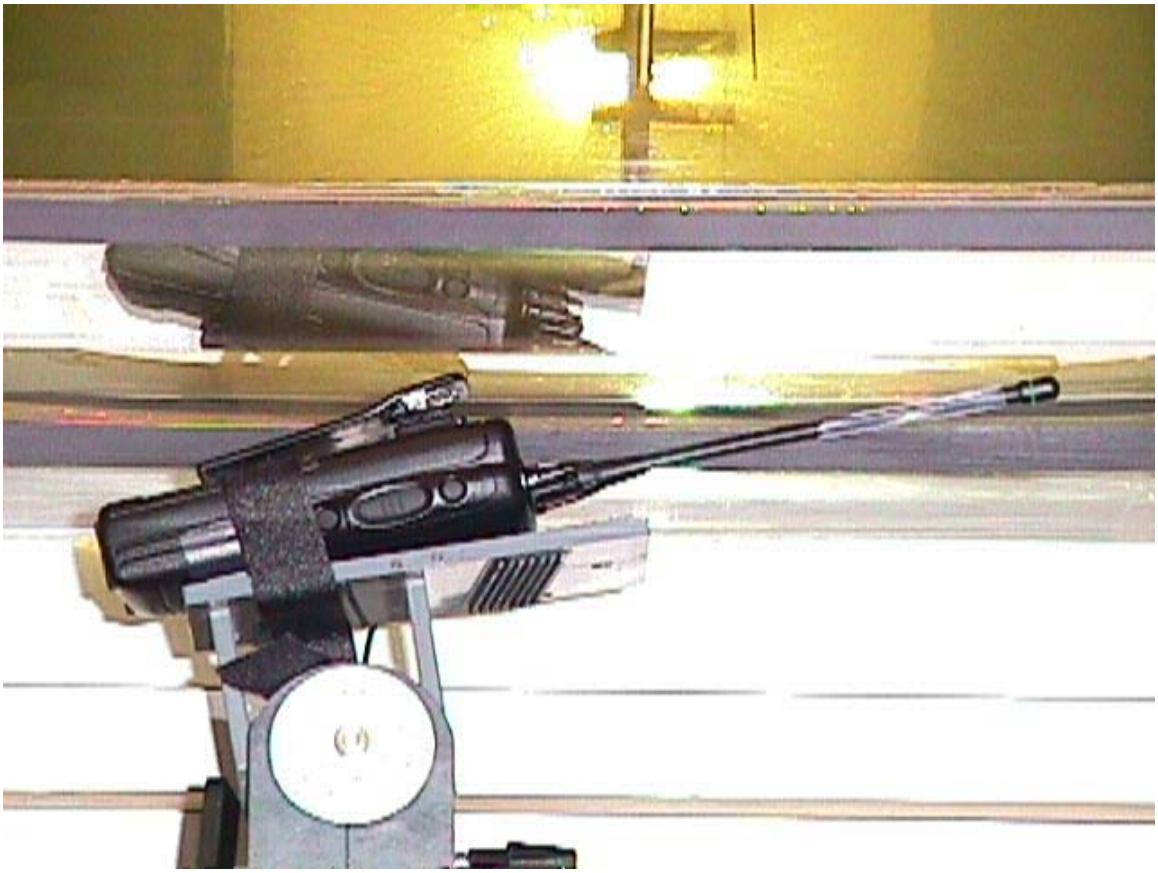
< The EUT parallel to the phantom with the alligator belt clip(M/N: MB-74) and headset(M/N: HS-51) – Overview >



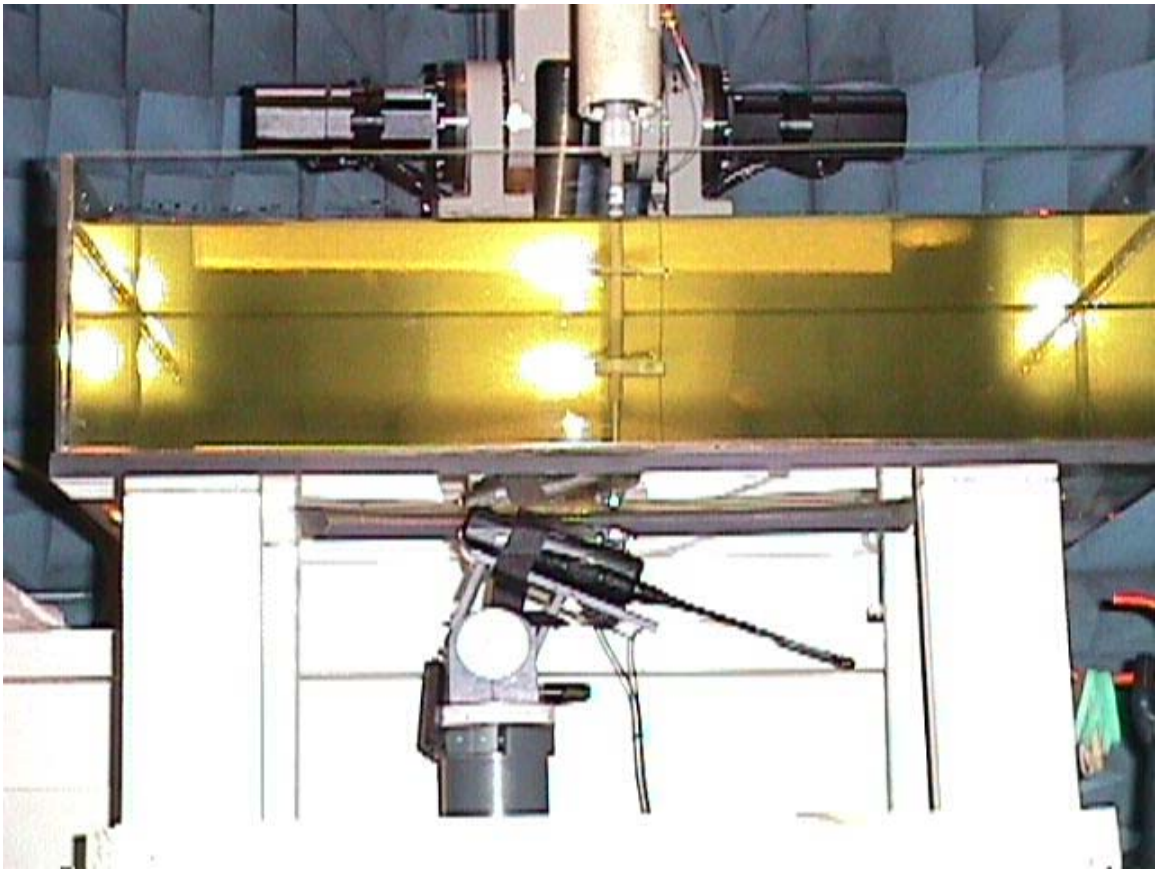
< The EUT parallel to the phantom with the alligator belt clip(M/N: MB-74) and headset(M/N: HS-51) – Close-up View >



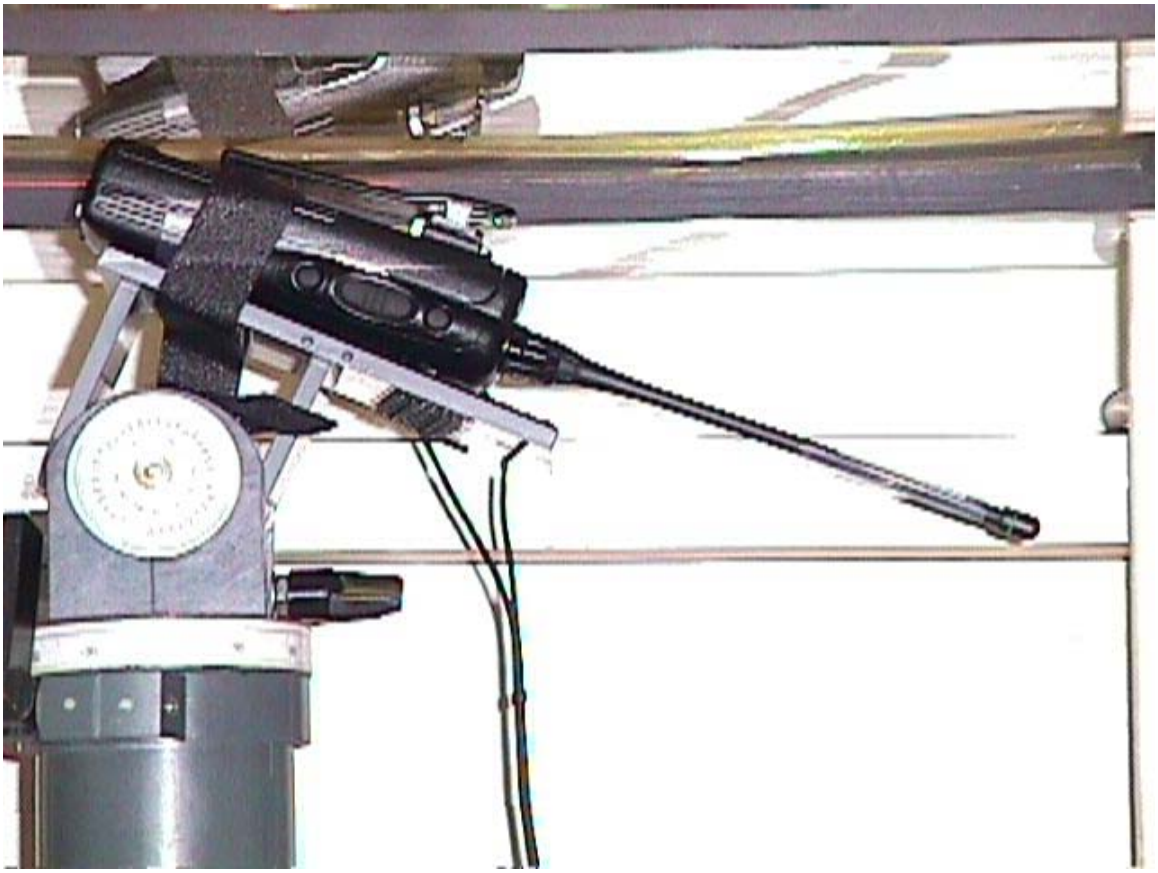
< The tip of the antenna in contact with the phantom with the alligator belt clip(M/N: MB-74) and headset(M/N: HS-51) – Overview >



< The tip of the antenna in contact with the phantom with the alligator belt clip(M/N: MB-74) and headset(M/N: HS-51) – Close-up View >



< The bottom of the EUT in contact with the phantom with the alligator belt clip(M/N: MB-74) and headset(M/N: HS-51) – Overview >

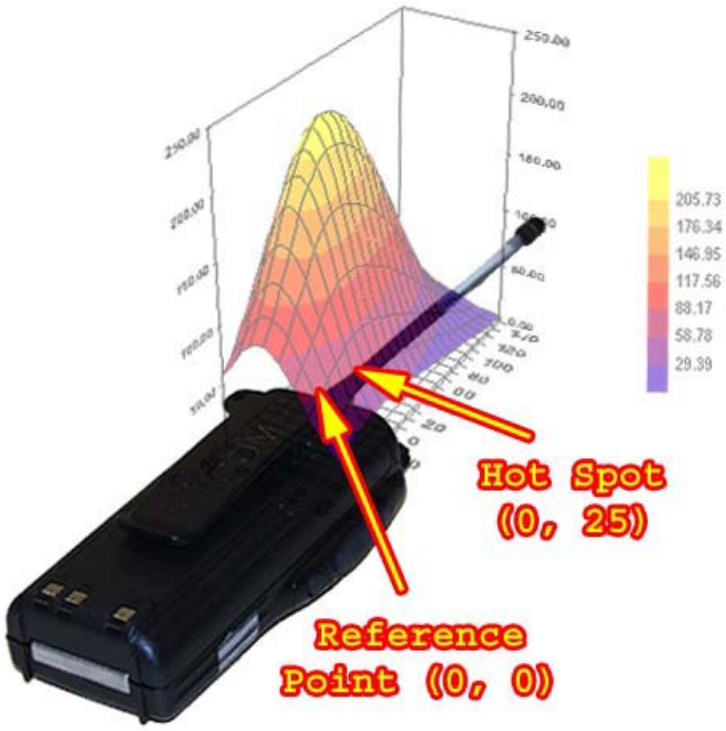


< The bottom of the EUT in contact with the phantom with the alligator belt clip(M/N: MB-74) and headset(M/N: HS-51) – Close-up View >

4.5. MAXIMUM FIELD LOCATION

The maximum field was found to be located at (0, 25) with the test configuration as described below:

- Body-worn configuration with the flat phantom
- EUT parallel to the phantom
- @ 400.05 MHz wide bandwidth
- M/N: BP-210 battery pack
- M/N: MB-68 belt clip
- M/N: HS-51 headset



Complete area scans with all possible test configurations were conducted to determine the location of the highest SAR.

4.6. PEAK SPATIAL-AVERAGE SAR MEASURED

Phantom Configurations	Device Test Positions	Antenna Position	SAR (W/kg) @ 400.05 MHz NB
Body-worn	EUT parallel to the phantom with Ni-MH battery pack (M/N: BP-210), belt clip (M/N: MB-68) and headset (M/N: HS-51)	Fixed	5.870 (11.740)

4.7. SAR MEASUREMENT DATA

4.7.1. Prescan results of head front configuration at 415.05 MHz NB (CH2, Narrow Bandwidth)

Test Configuration	SAR (W/Kg)	Location of hot spot (mm) * Base of antenna as reference point (0, 0)
EUT parallel to the phantom at 25 mm separation with M/N: BP-209 battery pack	3.990 (7.979)	(-5, 20)
EUT parallel to the phantom at 25 mm separation with M/N: BP-210 battery pack	**4.013 (8.025)**	**(-5 , 10)**
EUT parallel to the phantom at 25 mm separation with M/N: BP-222 battery pack	4.018 (8.035)	(0, 15)

*** The SAR Measurement inside the parenthesis indicates the reading before 50 % duty factor is applied for the half-duplex type PTT**

4.7.2. Test results of head front configuration with M/N: BP-210 battery pack

Test Configuration	Frequency (MHz)	SAR (W/Kg)	Location of hot spot (mm) * Base of antenna as reference point (0, 0)
EUT parallel to the phantom at 25 mm separation	400.05 NB (CH1)	4.297 (8.594)	(-10, 10)
	415.05 NB (CH2)	4.013 (8.025)	(-5, 10)
	429.95 NB (CH3)	3.556 (7.112)	(-5, 20)
	400.05 WB (CH4)	**4.392 (8.784)**	**(-5, 15)**
	415.05 WB (CH5)	3.913 (7.826)	(-5, 20)
	429.95 WB (CH6)	3.462 (6.924)	(-5, 20)

*** The SAR Measurement inside the parenthesis indicates the reading before 50 % duty factor is applied for the half-duplex type PTT**

4.7.3. Prescan results of body-worn configuration with M/N:BP-210 battery pack, M/N:MB-68 belt clip and M/N: HS-51 headset

Test Configuration	SAR (W/Kg)	Location of hot spot (mm) * Base of antenna as reference point (0, 0)
EUT parallel to the phantom	**4.908 (9.816)**	**(0, 15)**
Tip of the antenna in contact with the phantom	4.182 (8.363)	(0, -5) : the base of the antenna
	3.135 (6.207)	(0, 65) : the middle of the antenna
Bottom of EUT in contact with the phantom	1.878 (3.755)	(5, -110)

*** The SAR Measurement inside the parenthesis indicates the reading before 50 % duty factor is applied for the half-duplex type PTT**

4.7.4. Prescan results of body-worn configuration with M/N:BP-210 battery pack, M/N:MB-74 alligator belt clip and M/N: HS-51 headset

Test Configuration	SAR (W/Kg)	Location of hot spot (mm) * Base of antenna as reference point (0, 0)
EUT parallel to the phantom	3.665 (7.329)	(0, 20)
Tip of the antenna in contact with the phantom	3.099 (6.198)	(5, 80) – the middle of the antenna
	3.349 (6.697)	(10, 145) – the tip of the antenna
Bottom of EUT in contact with the phantom	1.364 (2.727)	(25, -100)

*** The SAR Measurement inside the parenthesis indicates the reading before 50 % duty factor is applied for the half-duplex type PTT**

4.7.5. Test results of body-worn configuration with M/N: BP-210 battery pack, M/N: MB-68 belt clip and M/N: HS-51 headset

Test Configuration	Frequency (MHz)	SAR (W/Kg)	Location of hot spot (mm) * Base of antenna as reference point (0, 0)
EUT parallel to the phantom	400.05 NB (CH1)	5.754 (11.507)	(0, 15)
	415.05 NB (CH2)	4.908 (9.816)	(0, 15)
	429.95 NB (CH3)	4.440 (8.880)	(0, 25)
	400.05 WB (CH4)	**5.870 (11.740)**	**(0. 25)**
	415.05 WB (CH5)	4.954 (9.907)	(0, 20)
	429.95 WB (CH6)	4.750 (9.500)	(0, 20)

*** The SAR Measurement inside the parenthesis indicates the reading before 50 % duty factor is applied for the half-duplex type PTT**

EXHIBIT 5. SAR SYSTEM CONFIGURATION & TEST METHODOLOGY

5.1. MEASUREMENT SYSTEM SPECIFICATIONS

Positioning Equipment	Probe
Type : 3D Near Field Scanner Location Repeatability : 0.1mm Speed 180 °/sec AC motors	Sensor : E-Field Spatial Resolution : 0.1 cm^3 Isotropic Response : ± 0.25 dB Dynamic Range : 2 W/g to 100 mW/g
Computer	**Phantom**
Type : Pentium III 500MHz CPU Memory : 256 Meg. RAM Operating System : Windows 2000 Professional Monitor : 17"	Tissue : Simulated Tissue with electrical characteristics similar to those of the human at normal body temperature. Shell : Fiberglass human shell shaped (1.5 mm thick)

5.2. TEST PROCEDURES

In the SAR measurement, the positioning of the probes must be performed with sufficient accuracy to obtain repeatable measurements in the presence of rapid spatial attenuation phenomena. The accurate positioning of the E-field probe is accomplished by using a high precision robot. The robot can be taught to position the probe sensor following a specific pattern of points. In a first sweep, the sensor is positioned as close as possible to the interface, with the sensor enclosure touching the inside of the fiberglass shell. The SAR is measured on a grid of points, which covers the curved surface of the phantom in an area larger than the size of the EUT. After the initial scan, a high-resolution grid is used to locate the absolute maximum measured energy point. At this location, attenuation versus depth scan will be accomplished by the measurement system to calculate the SAR value.

5.3. PHANTOM

The phantom used in the evaluation of the RF exposure of the user of the wireless device is a clear fiberglass enclosure 1.5 mm thick, shaped like a human head or body and filled with a mixture simulating the dielectric characteristics of the brain, muscle or other types of human tissue. The maximum width of the cranial model is 17 cm, the cephalic index is 0.7 and the crown circumference of the cranial model is 61 cm. The ear is 6 mm above the outer surface of the shell.

5.4. SIMULATED TISSUE

Simulated Tissue: Suggested in a paper by George Hartsgrove and colleagues in University of Ottawa Ref.: Bioelectromagnetics 8:29-36 (1987)

Ingredient	Quantity
Water	40.4 %
Sugar	56.0 %
Salt	2.5 %
HEC	1.0 %
Bactericide	0.1 %

Table. Example of composition of simulated tissue.

This simulated tissue is mainly composed of water, sugar and salt. At higher frequencies, in order to achieve the proper conductivity, the solution does not contain salt. Also, at these frequencies, D.I. water and alcohol is preferred.

Tissue Density: Approximately 1.25 g/cm^3

5.4.1. Preparation

We determine the volume needs and carefully measure all components. A clean container is used where the ingredients will be mixed. A stirring paddle mounted to a drill press is used to stir the mixture. First we heat the DI water to about 40 ^{o}C to help the ingredients dissolve and then we pour the salt and the bactericide. We stir until all the ingredients are completely dissolved. We continue stirring slowly while adding the sugar. We avoid high RPM from the mixing device to prevent air bubbles in the mixture. Later on, we add the HEC to maintain the solution homogeneous. Mixing time is approximately 30 to 40 min.

5.5. MEASUREMENT OF ELECTRICAL CHARACTERISTICS OF SIMULATED TISSUE

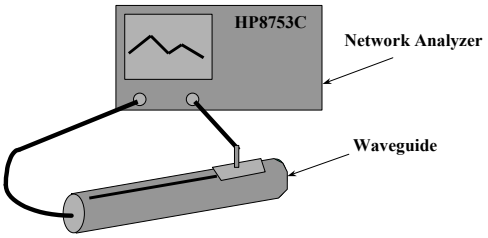
1) Network Analyzer HP8753C or others
2) Slotted Coaxial Waveguide

5.5.1. Description Of The Slotted Coaxial Waveguide

The cylindrical waveguide is constructed with copper tube of about 30 to 40 cm in length, generally 12.5 mm diameter, with connectors at both ends. Inside of this tube, a conductive rod about 6.3 mm is coaxial supported by the two ends connectors (radiator). A slot 3 mm wide start at the beginning of the tube to approximately two thirds of the tube length. The outer edge of the slotted tube is marked in increments of 1 centimeter (10 to 12), and 0.5 centimeter for higher frequencies. A saddle piece containing the sampling probe is inserted in the slot so the tip of the probe is close but not in contact with the inner conductor (radiator).

To measure the electrical characteristics of the liquid simulated tissue, we fill the coaxial waveguide with the mixture, select CW frequency and measure amplitude and phase with the Network Analyzer for every point in the slot (typically 11). An effort is made to keep the resultant dielectric constant and conductivity within 5 % of published data.

Electrical Characteristics Measurement Setup



$$c = 3 \cdot 10^8 \text{ m/s}$$

$$A = \frac{\Delta A}{20} \ln_{10} \frac{1}{m}$$

$$\theta = \frac{\Delta\theta \cdot 2\pi}{360}$$

$$\lambda = \frac{c}{f} \cdot \frac{100}{2.54} \text{ inches}$$

$$\varepsilon_{re} = \frac{(A^2 + \theta^2) \cdot \lambda^2}{4\pi^2}$$

$$\theta' = \left| \frac{|A| \cdot \lambda}{4\pi\sqrt{\varepsilon_{re}}} \right|$$

$$S = \tan(2\theta')$$

$$\varepsilon_r = \frac{\varepsilon_{re}}{\sqrt{(1 + S^2)}}$$

$$\sigma = S \cdot 2\pi \cdot f \cdot 8.854 \cdot 10^{12} \cdot \varepsilon_r \text{ (S/m)}$$

Where: ΔA is the amplitude attenuation in dB
$\Delta\theta$ is the phase change in degrees for 5 cm of wave propagation in the slotted line
f is the frequency of interest in Hz.

5.6. SYSTEM DESCRIPTION

The measurement system consists of an E-field probe, instrumentation amplifiers, RF transparent cable connecting the amplifiers to the computer, the robotics arm with its extension and proximity sensors, a phantom with simulated tissue and a radio holder to support the device under test. The E-field probe is a three channel device used to measure RF electric fields in the near vicinity of the source. The three sensors are mutually orthogonal positioned dipoles, and are constructed over a quartz substrate. Located in the center of the dipole is a Schottky diode. High impedance lines are connecting the sensor to the amplifier and then optically linked to the computer. The probe has an isotropic response and is transparent to the RF fields.

Calibration is performed by two steps:

1) Determination of free space E-field from amplified probe outputs in a test RF field. This calibration is performed in a TEM cell when the frequency is below 1 GHz and in a waveguide or some other methodologies above 1 GHz. For the free space calibration, we place the probe in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. This reading equate to 1mW/cm^2 if that power density is available in the correspondent cavity.

2) Correlation of the measured free space E-field, to temperature rise in a dielectric medium. E-field temperature correlation calibration is performed in a planar phantom filled with the appropriate simulated tissue.

For temperature correlation calibration, a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe. First, the location of the maximum E-field close to the phantom's inner surface is determined as a function of power into the RF source; in this case, a dipole. Then, the E-field probe is moved sideways so that the temperature probe, while affixed to the E-field probe is placed at the previous location of the E-field probe. Finally, temperature changes for 30 seconds exposure at the same RF power levels used for the E-field measurement are recorded. The following equation relates SAR to initial temperature slope:

$$SAR = C\frac{\Delta T}{\Delta t}$$

where: t = exposure time (30 seconds),
C = heat capacity of tissue (brain or muscle),
T = temperature increase due to RF exposure.

The heat capacity used for brain simulated tissue is 2.7 joules/^{0}C/g and 3.0 joules/^{0}C/g for muscle.

SAR is proportional to T / t, the initial rate of tissue heating, before thermal diffusion takes place. Now, it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E-field;

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

where: = Simulated tissue conductivity
= Tissue density (1.25 g/cm^3 for simulated tissue)

5.7. DATA EXTRAPOLATION (CURVE FITTING)

The distance from the center of the sensor (diode) to the end of the protective tube is called the 'probe offset'. To compensate we use an exponential curve fitting method to obtain the peak surface value from the voltages measured at the distance from the inner surface of the phantom. At the point where the highest voltage was recorded, the field is measured as close as possible to the phantom's surface and every 1mm along the ` Z ` axis for a distance of 50 mm. The appropriate exponential curve is obtained from all the points measured and used to define an exponential decay of the energy density versus depth.

$$E(z) = E_0 \cdot e^{-z/\delta} \text{ (mV)}$$

5.8. INTERPOLATION AND GRAM AVERAGING

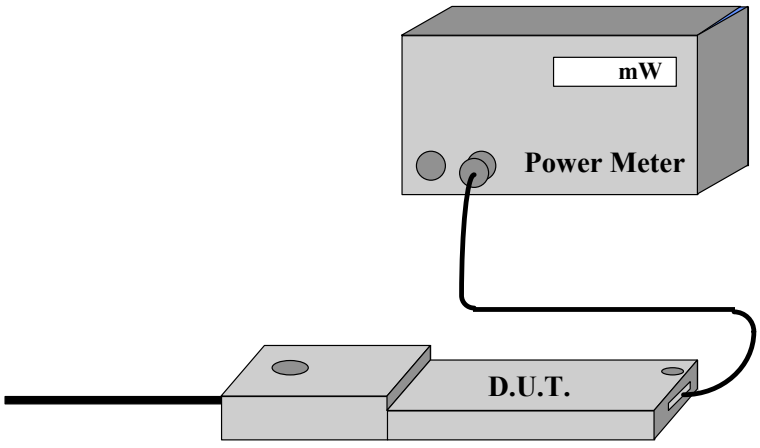
The voltage, (1 cm) above the phantoms surface (E_{tot} 1 cm), is needed to calculate the exposure over one gram of tissue. This SAR value that estimates the average over 1 gram of tissue, is obtained by taking the integral over 1 cm^2 surface of the measured field along the exponential decay curve of the energy density with depth.

$$SAR(mW/g) = \int_{v=1g} SAR(\bullet)dv = \int_{s=1cm^2} \int_0^{1cm} E(z) \cdot \frac{CF}{SensorFactor} dzds$$

5.9. POWER MEASUREMENT

Whenever possible, a conducted power measurement is performed. To accomplish this, we utilize a fully charged battery, a calibrated power meter and a cable adapter provided by the manufacturer. The data of the cable and related circuit losses are also provided by the manufacturer. The power measurement is then performed across the operational band and the channel with the highest output power is recorded.

Power measurement is performed before and after the SAR to verify if the battery was delivering full power at the time of testing. A difference in output power would determine a need for battery replacement and to repeat the SAR test.



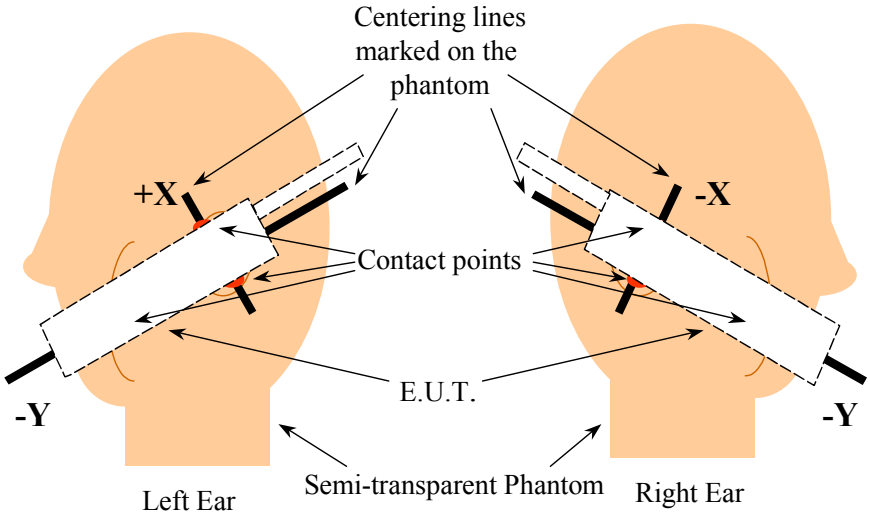
Measured Power + Cable and Switching Mechanism Loss

5.10. POSITIONING OF EUT

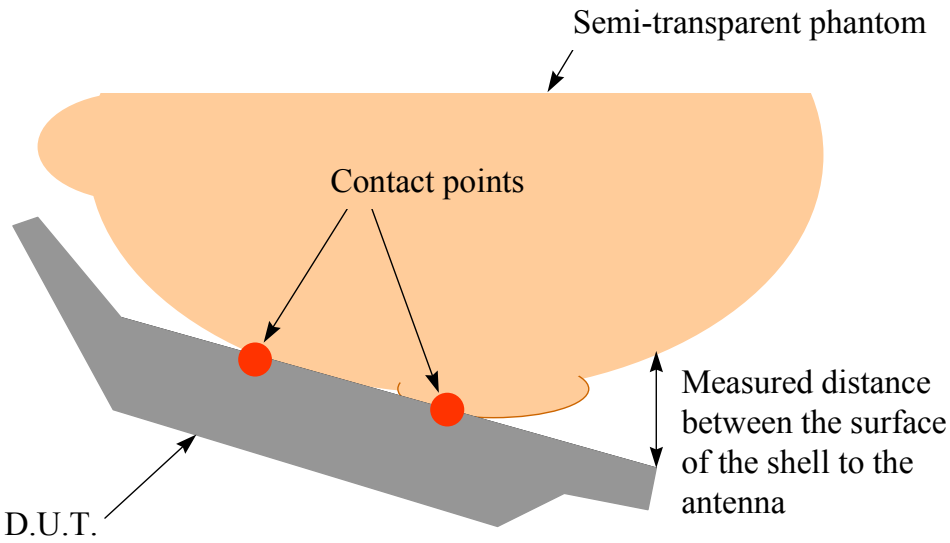
The clear fiberglass phantom shell have been previously marked with a highly visible line, so it can easily be seen through the liquid simulated tissue. In the case of testing a cellular phone, this line is connecting the ear channel with the corner of the lips. The EUT is then placed by centering the speaker with the ear channel and the center of the radio width with the corner of the mouth. At the same time the surface of the EUT is always in contact with the phantoms shell. Three points contact; two in the ear region and one on the chin in addition to the previously describe alignment will assure repeatability of the test.

For HAND HELD devices (push-to-talk), or any other type of wireless transmitters, the EUT will be positioned as suggested by manufacturer operational manuals.

Positioning of theE.U.T.



Side View


Semi-transparent phantom
Contact points
Measured distance between the surface of the shell to the antenna
D.U.T.

5.11. SAR MEASUREMENT UNCERTAINTY

This uncertainty analysis covers the 3D-EMC Laboratory test procedure for Specific Absorption Rate (SAR) associated with wireless telephones and similar devices.

Standards Covered Are:

WGMTE 96/4 - Secretary SC211/B

FCC 96-326, ET Docket No. 93-62

Industry Canada RSS 102

ACA Radiocommunications (Electromagnetic Radiation – Human Exposure) Amendment Standard 2000 (No. 1)

The laboratory test procedure, and this uncertainty analysis, may be used to cover all standards above. It is based on test equipment and procedures specified by 3D-EMC Laboratories, Inc. located in Ft. Lauderdale, Florida.

Measurement Uncertainty:

Table I. Estimated SAR Measurement Uncertainty

Contribution	Error (±dB)	Probability Distribution	Type Evaluation	Standard Uncertainty (±dB)
A. Field Measurement Errors:		Rectangular	Type B	
Isotropy in Phantom BTS Liquid	0.8			0.46
Frequency Response	0.2			0.12
Linearity	0.2			0.12
Probe Calibration Error (rss)	0.7			0.40
Duty Factor Variability	0.2			0.12
B. Spatial Peak SAR Errors:		Normal	Type A	
Extrapolation & Interpolation, and Position	0.2			0.20
Integration & Search Routine	0.1			0.10
Cube Shape	0.2			0.20
C. Additional Errors:		Rectangular	Type B	
Solution Variability (Worst-Case SAR)	0.21			0.12
D. Combined Standard Uncertainty, u_c:		Normal	-	0.52
E. Expanded Uncertainty, U:		Normal (k=2)	-	1.04
		95% Confidence	-	27.14%

EXHIBIT 6. BODY WORN CONFIGURATION INFORMATION

FCC OET 65 Supplement C Requirements

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. The EUT was placed against the phantom and tested in its appropriate holster as would normally be used by the end user. If the SAR measured at the middle channel for each test is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional

When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. **A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances**. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components..

Equipment permutation investigated for each orientation

The EUT is intended to be used as a body worn device. An investigation were carried out using the body worn requirements as a guideline. As such, a preliminary scan on all possible configuration were carried out to determine the potential hot spot locations.

Comments on non-tested configurations

N/A

Recommended Caution Statements to be included in Users Manual

In order for users to be aware of the body-worn operating requirements for meeting RF exposure compliance, operating instructions and caution statements should be included in the manual. The information should allow users to make informed decisions on the type of body-worn accessories and operating configurations that are appropriate for the device. The following are *examples* of typical statements that provide end-users with the necessary information about body-worn accessories:

1. For a product that has the potential to be used in a body worn configuration and has been tested and certified with a specific accessory device(s):

> **"For body worn operation, this device has been tested and meets the FCC RF exposure guidelines when used with the (*manufacturer name*) accessories supplied or designated for this product. Use of other accessories may not ensure compliance with FCC RF exposure guidelines. "**

2. For a product that has the potential to be used in a body worn configuration and has not been certified with a specific accessory device(s):

> "For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with an accessory that contains no metal and that positions the device a minimum of 1.5cm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines."

3. For a product that has the potential to be used in a body worn configuration with future manufacturer designed accessories:

> "For body worn operation, this device has been tested and meets the FCC RF exposure guidelines when used with a (*manufacturer name*) accessory designated for this product or when used with an accessory that contains no metal and that positions the handset a minimum of (specified distance) from the body."

EXHIBIT 7. TEST RESULTS OF HEAD FRONT CONFIGURATION WITH M/N: BP-210 BATTERY PACK

Test results of head front configuration are presented in following order:

Test Configuration	Frequency (MHz)	SAR (W/Kg)	Location of hot spot (mm) * Base of antenna as reference point (0, 0)
EUT parallel to the phantom at 25 mm separation	400.05 NB (CH1)	4.297 (8.594)	(-10, 10)
	415.05 NB (CH2)	4.013 (8.025)	(-5, 10)
	429.95 NB (CH3)	3.556 (7.112)	(-5, 20)
	400.05 WB (CH4)	4.392 (8.784)	(-5, 15)
	415.05 WB (CH5)	3.913 (7.826)	(-5, 20)
	429.95 WB (CH6)	3.462 (6.924)	(-5, 20)

*** The SAR Measurement inside the parenthesis indicates the reading before 50 % duty factor is applied for the half-duplex type PTT**

Test Information

Date : 28/11/2001
Time : 5:46:29 PM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 400.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Head Front	**Dielectric Constant**	: 45.16
Simulated Tissue	: Brain	**Conductivity**	: 0.90

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.92
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.430	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.920

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

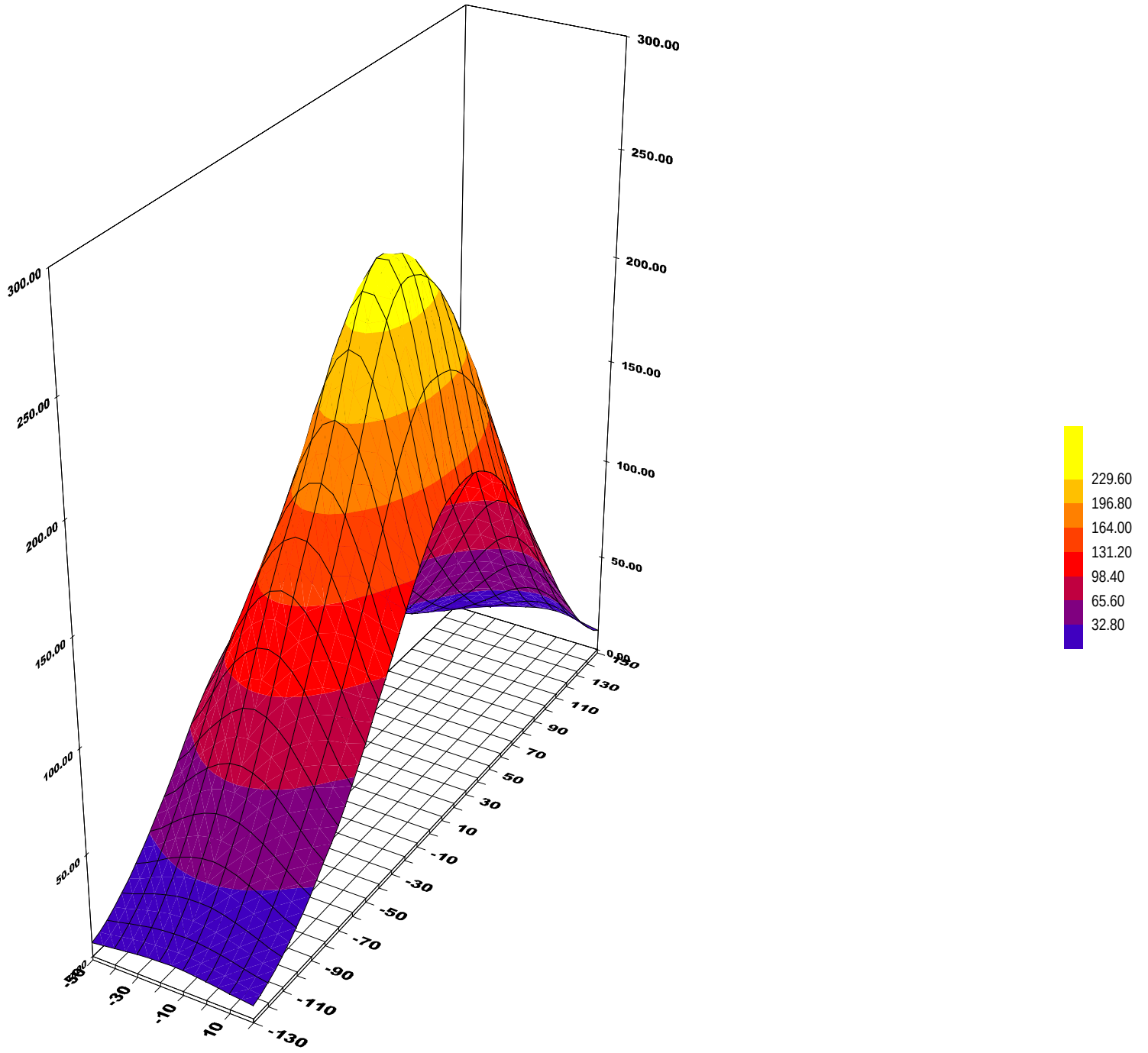
Location of Maximum Field :

X = -10 Y = 10

Measured Values (mV) :

258.402	240.044	213.752	194.382	182.610	172.338
161.052	152.843	144.387	137.251	129.563	

Peak Voltage (mV) : 300.690 **1 Cm Voltage (mV)** : 156.925 **SAR (W/Kg)** : 8.594


300.00
250.00
200.00
150.00
100.00
50.00
300.00
250.00
200.00
150.00
100.00
50.00
150
130
110
90
70
50
30
10
-10
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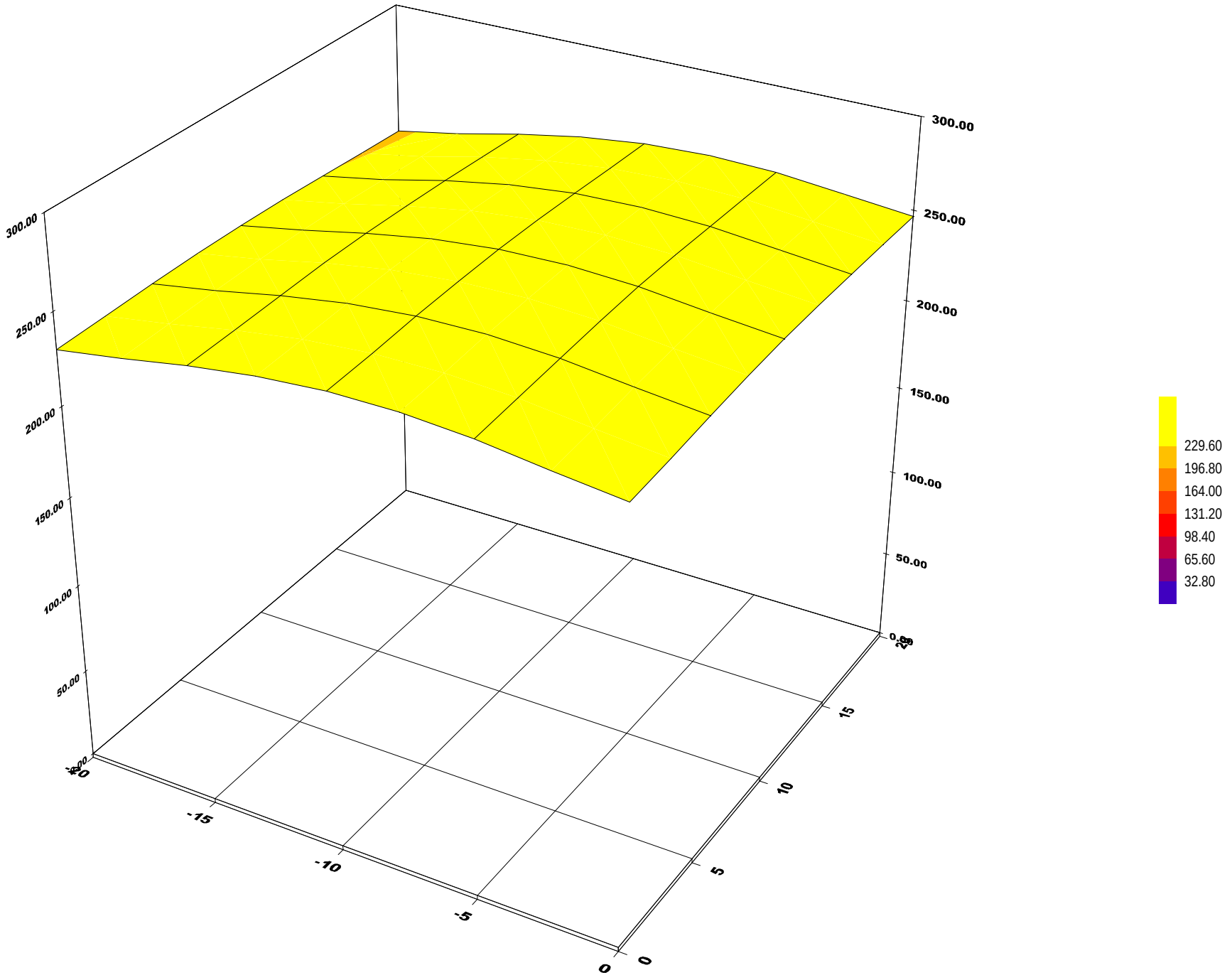
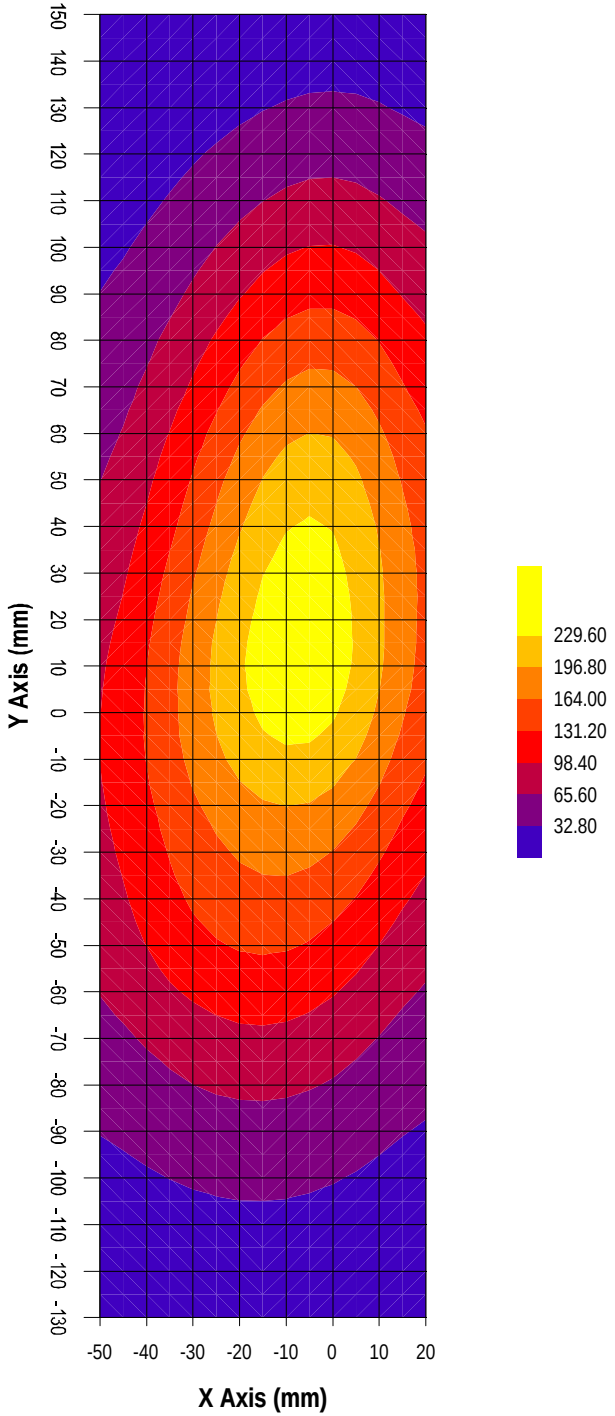
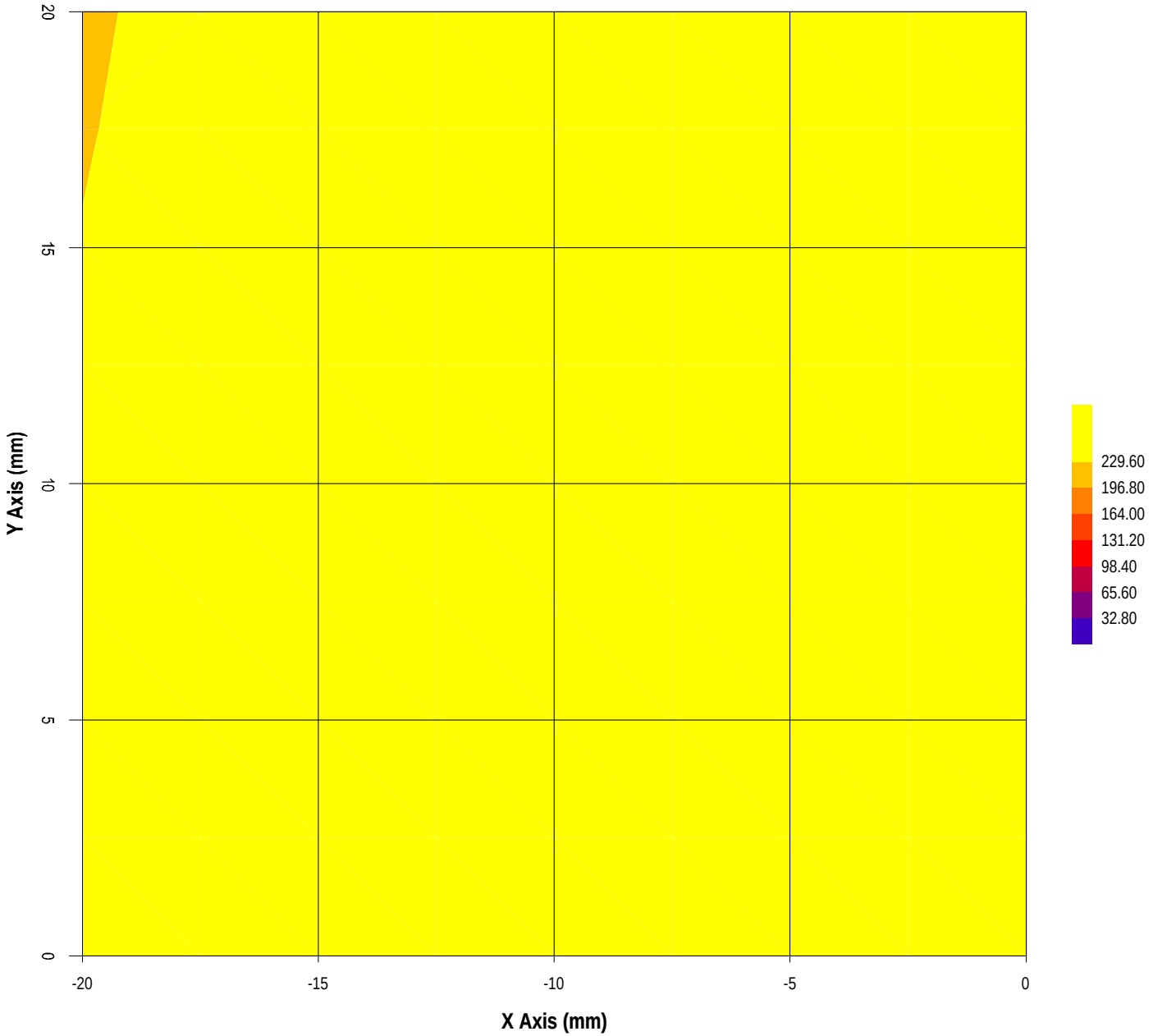
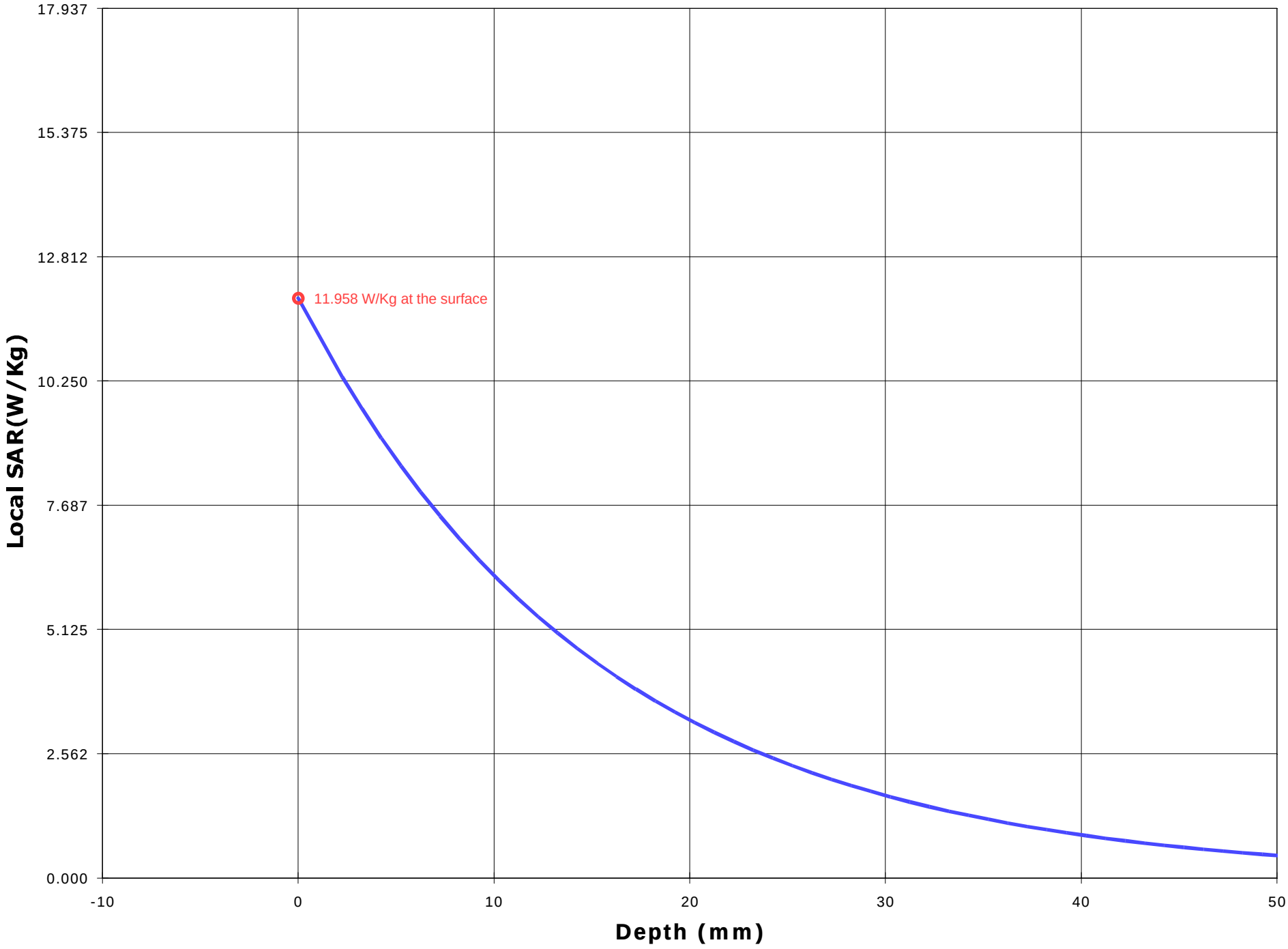
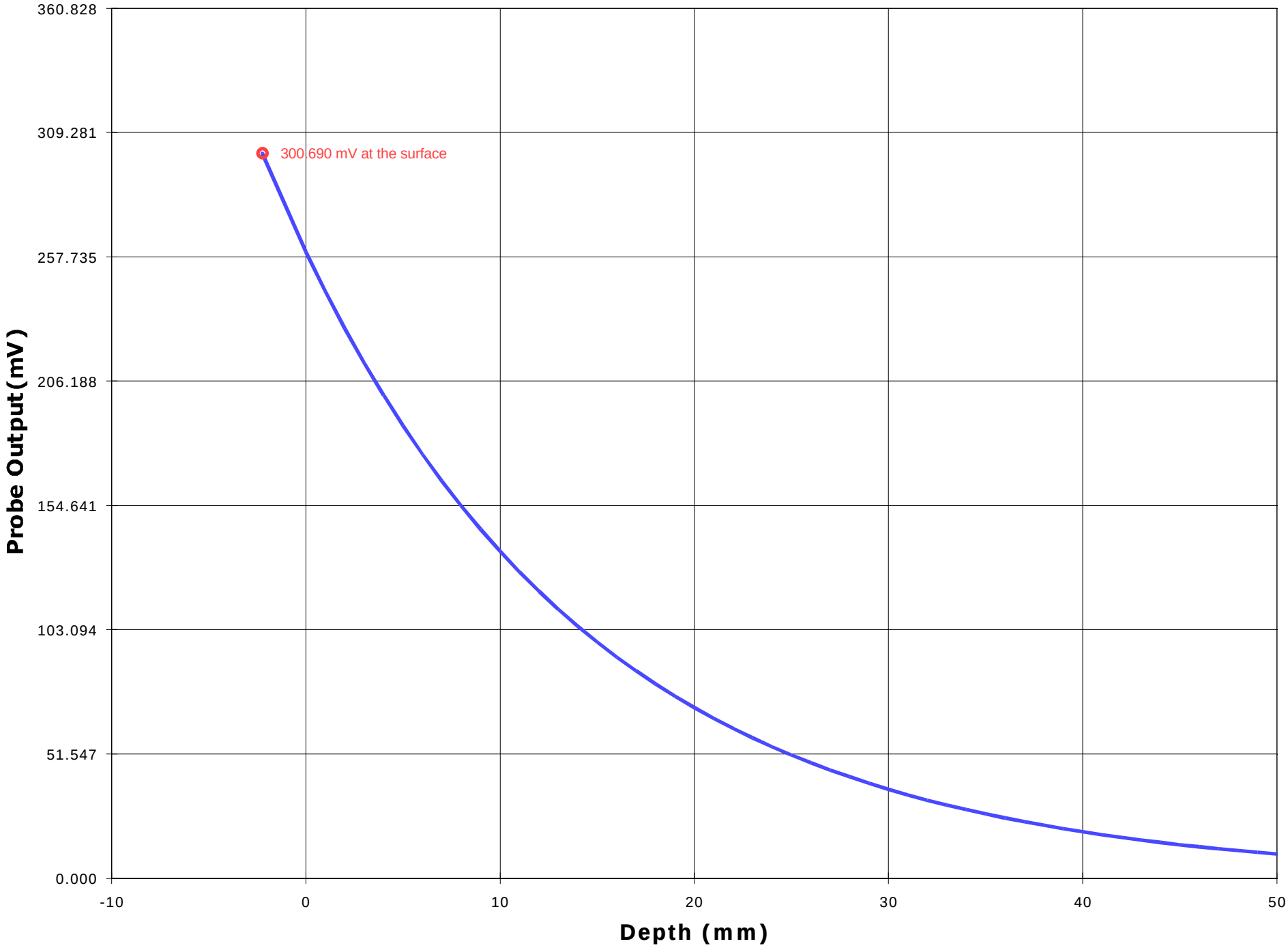
196.80
164.00
131.20
98.40
65.60
32.80


300.00
250.00
200.00
150.00
100.00
50.00
0.00
-20
-15
-10
-5
0
0
5
10
15
20
300.00
250.00
200.00
150.00
100.00
50.00
0.00
229.60
196.80
164.00
131.20
98.40
65.60
32.80


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-50
-40
-30
-20
-10
0
10
20
X Axis (mm)
229.60
196.80
164.00
131.20
98.40
65.60
32.80


Y Axis (mm)
20
15
10
5
0
-20
-15
-10
-5
0
X Axis (mm)
229.60
196.80
164.00
131.20
98.40
65.60
32.80


17.937
15.375
12.812
10.250
7.687
5.125
2.562
0.000
Local SAR(W/Kg)
11.958 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


360.828
309.281
257.735
206.188
154.641
103.094
51.547
0.000
Probe Output (mV)
300.690 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 28/11/2001
Time : 5:22:09 PM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 415.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Head Front	**Dielectric Constant**	: 45.16
Simulated Tissue	: Brain	**Conductivity**	: 0.90

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.96
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.430	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.960

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

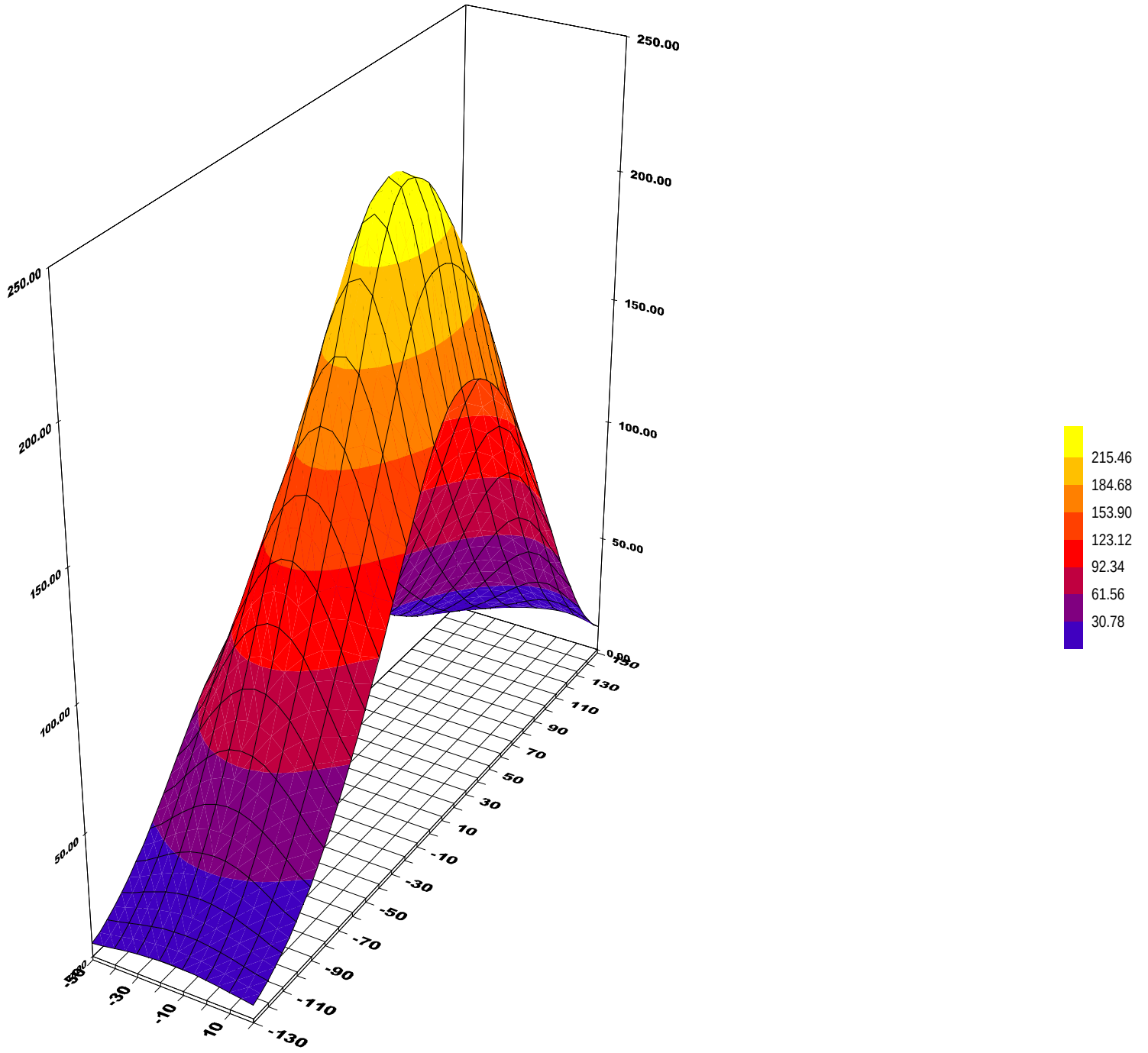
Location of Maximum Field :

X = -5 Y = 10

Measured Values (mV) :

241.005	221.768	199.859	183.568	170.679	160.194
150.613	141.647	133.846	126.879	120.418	

Peak Voltage (mV) : 280.666 **1 Cm Voltage (mV)** : 145.191 **SAR (W/Kg)** : 8.025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50.00
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200.00
150.00
100.00
50.00
0.00
150
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90
70
50
30
10
-10
-30
-50
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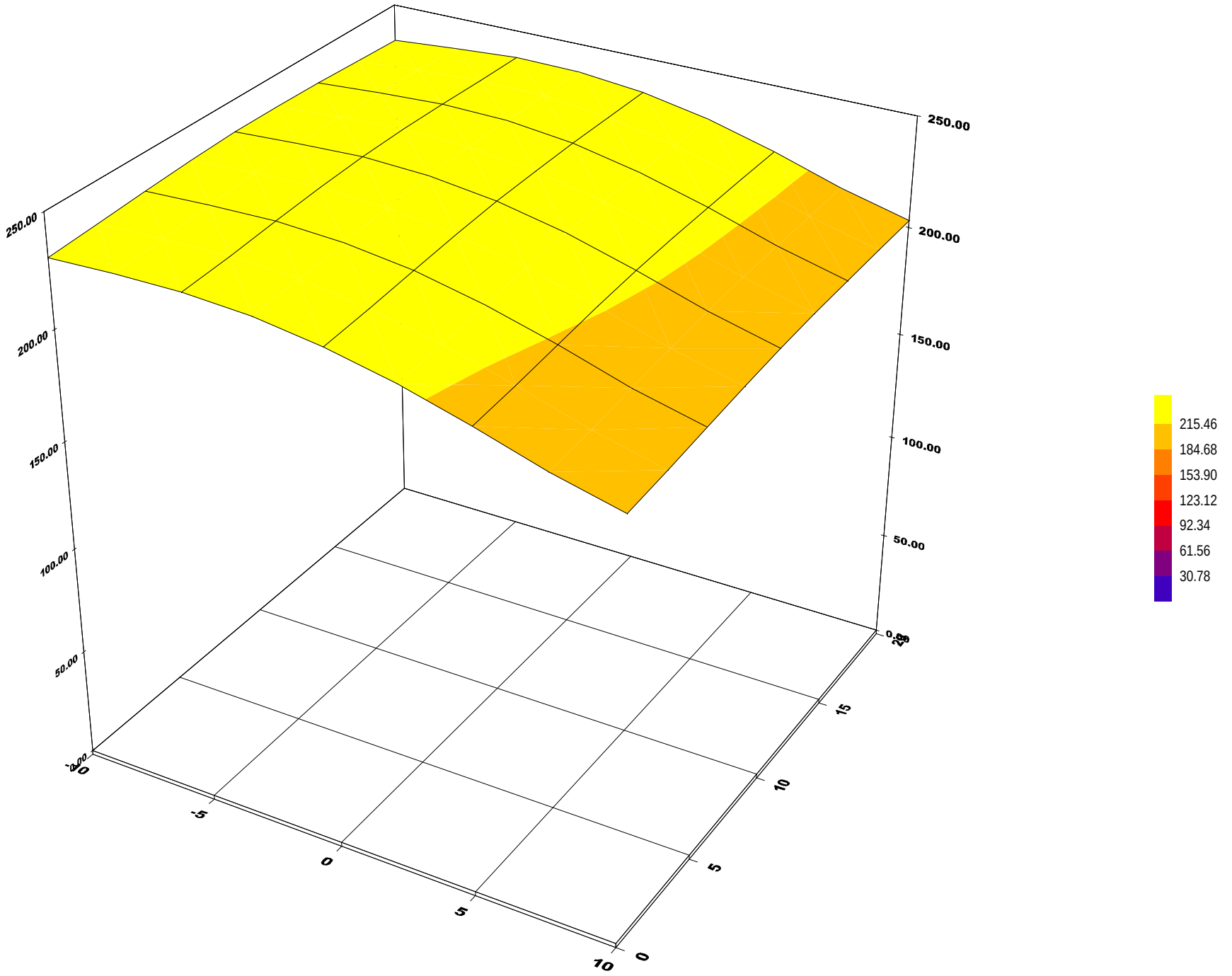
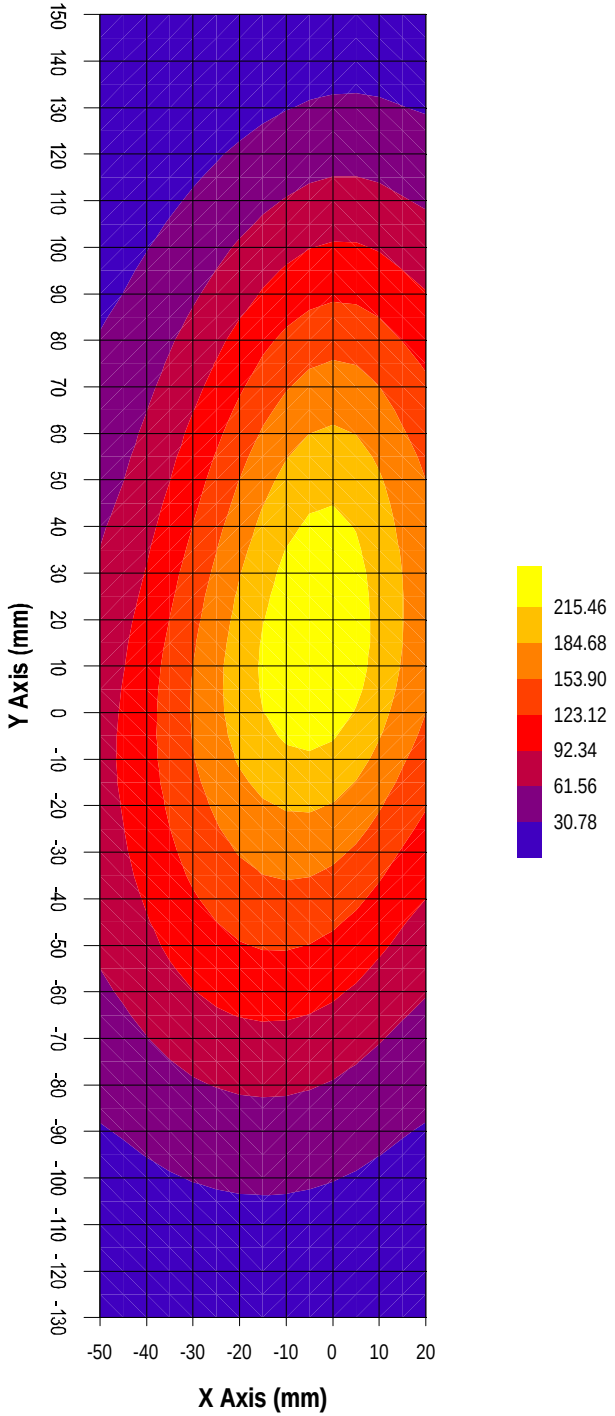
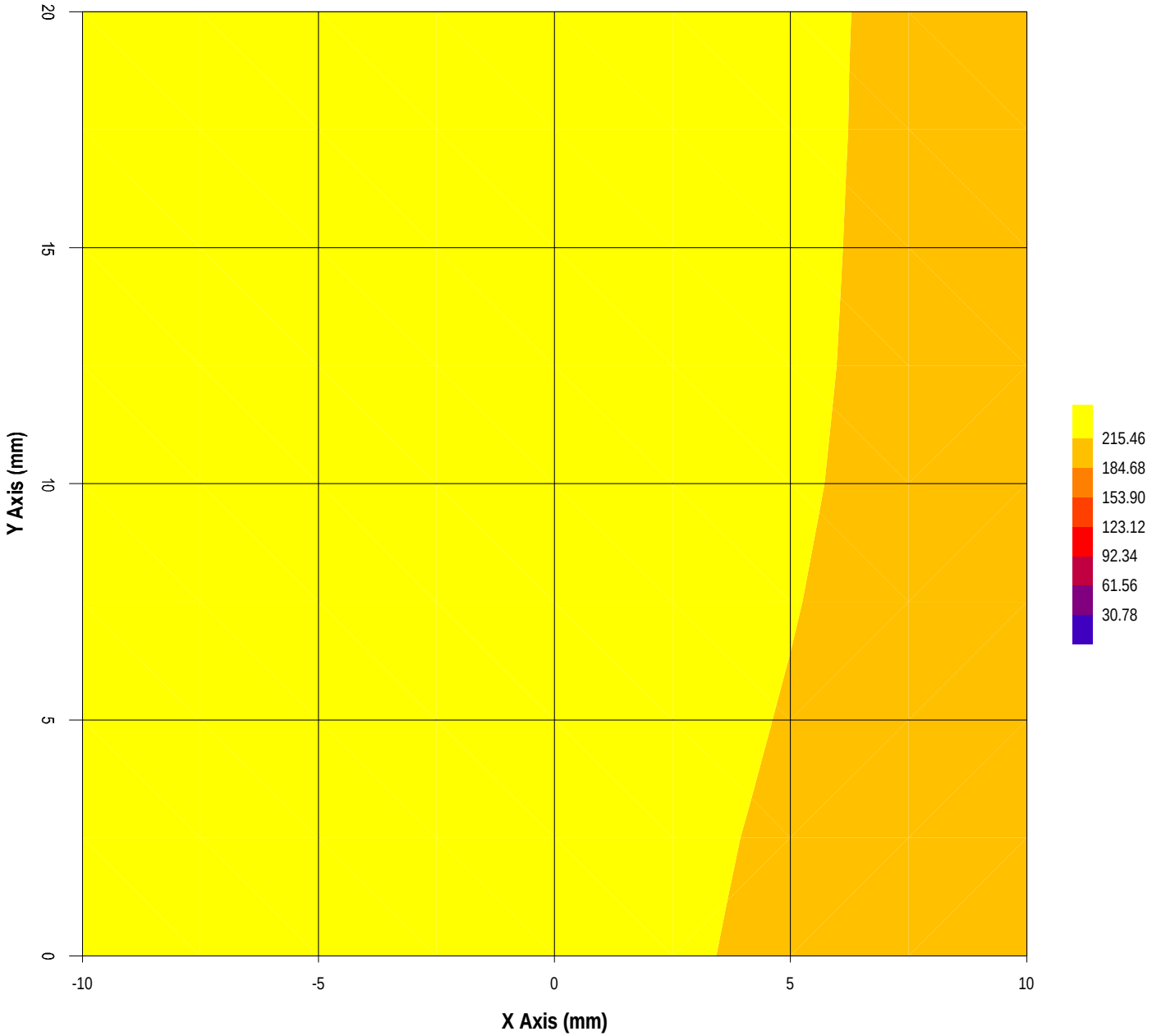
-10
10
215.46
184.68
153.90
123.12
92.34
61.56
30.78


250.00
200.00
150.00
100.00
50.00
-10
-5
0
5
10
0
5
10
15
20
250.00
200.00
150.00
100.00
50.00
0.00
215.46
184.68
153.90
123.12
92.34
61.56
30.78


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-50
-40
-30
-20
-10
0
10
20
X Axis (mm)
215.46
184.68
153.90
123.12
92.34
61.56
30.78


Y Axis (mm)
20
15
10
5
0
-10
-5
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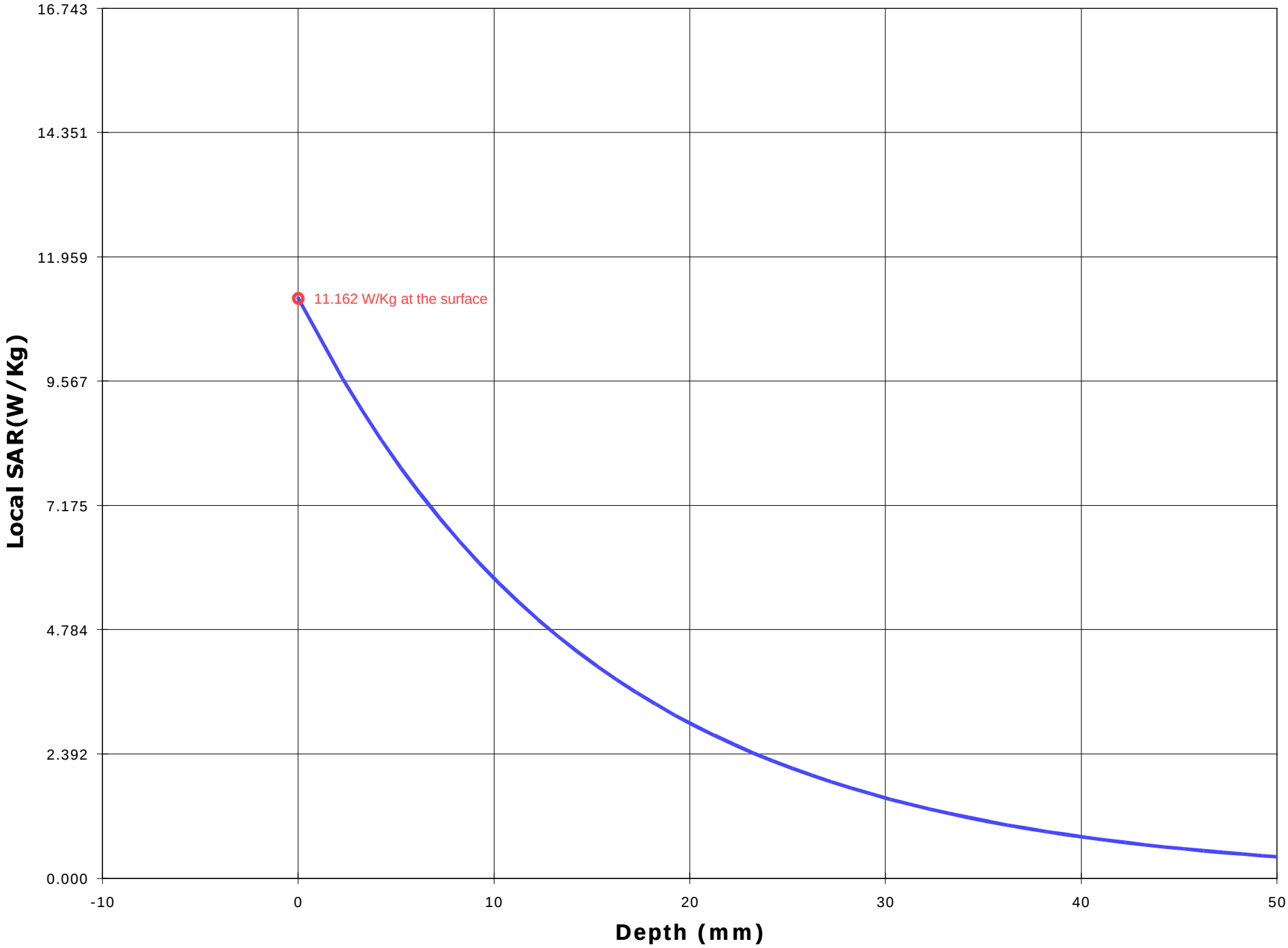
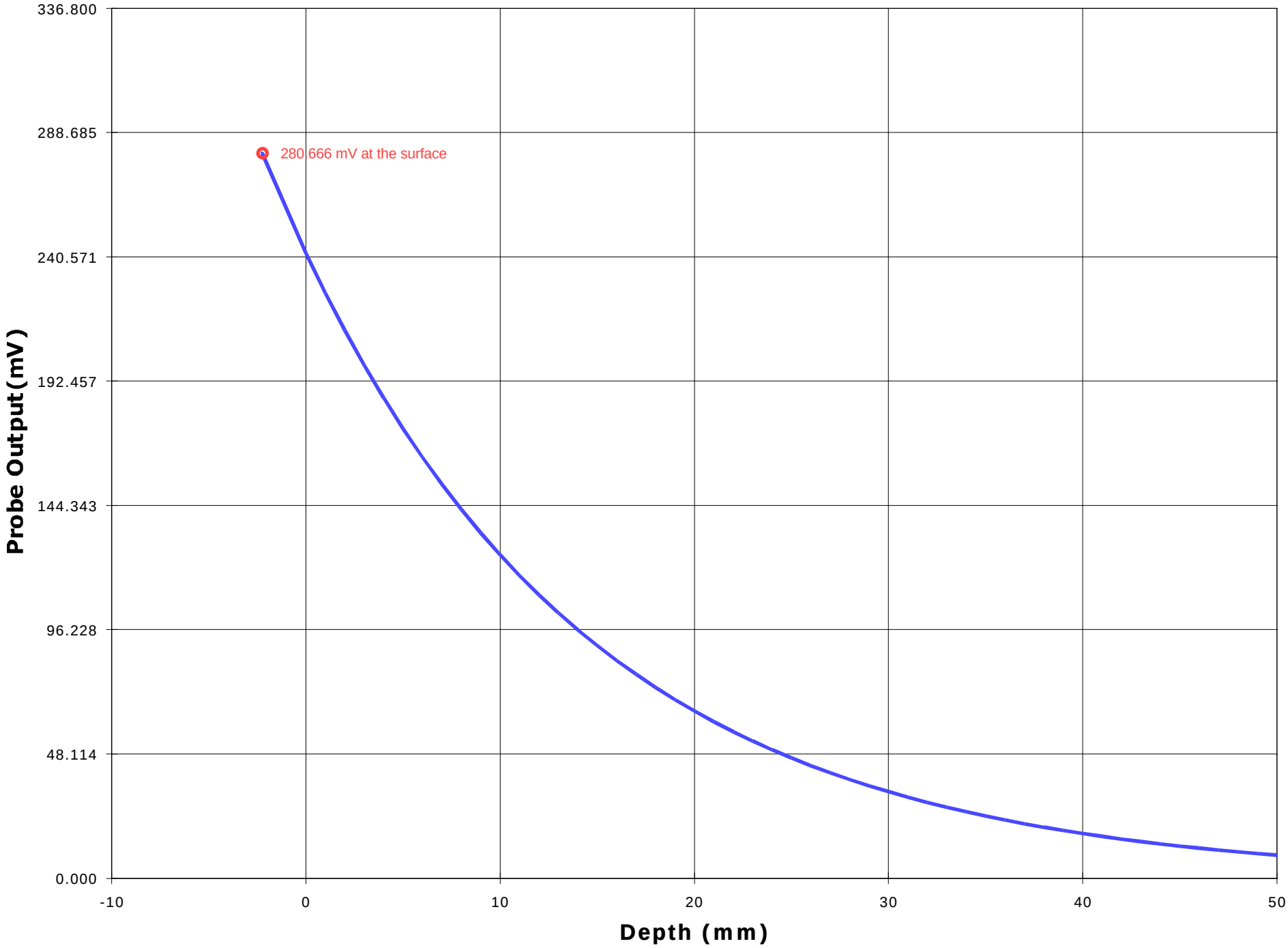
5
10
X Axis (mm)
215.46
184.68
153.90
123.12
92.34
61.56
30.78


16.743
14.351
11.959
9.567
7.175
4.784
2.392
0.000
Local SAR(W/Kg)
11.162 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


336.800
288.685
240.571
192.457
144.343
96.228
48.114
0.000
Probe Output (mV)
280.666 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 28/11/2001
Time : 6:11:22 PM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 429.95
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Head Front	**Dielectric Constant**	: 45.16
Simulated Tissue	: Brain	**Conductivity**	: 0.90

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 4.08
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.430	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 4.080

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

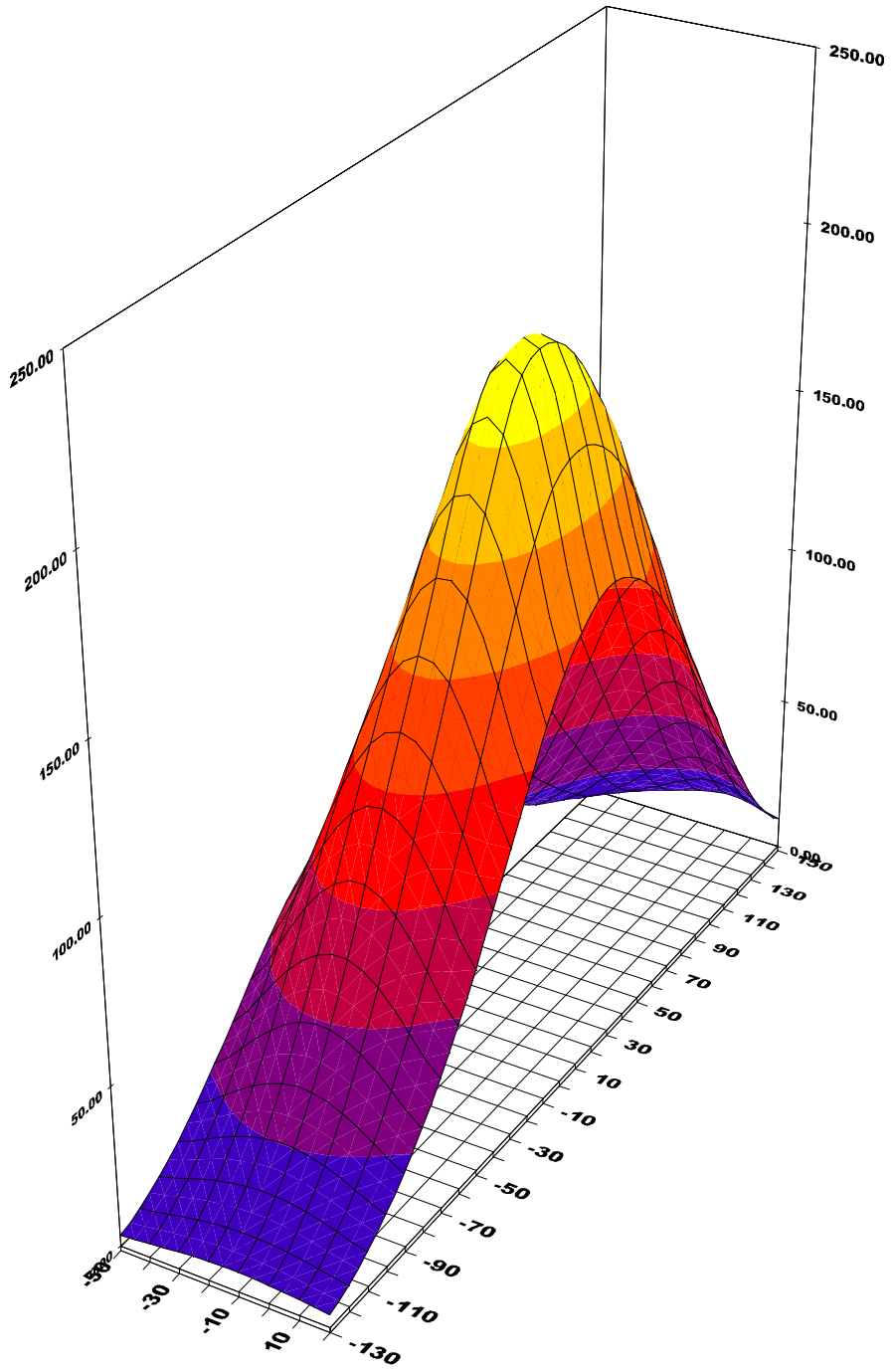
Location of Maximum Field :

X = -5 Y = 20

Measured Values (mV) :

213.344	199.404	176.107	161.410	151.279	141.727
133.963	126.813	118.123	111.826	105.644	

Peak Voltage (mV) : 249.256 **1 Cm Voltage (mV)** : 127.690 **SAR (W/Kg)** : 7.112


250.00
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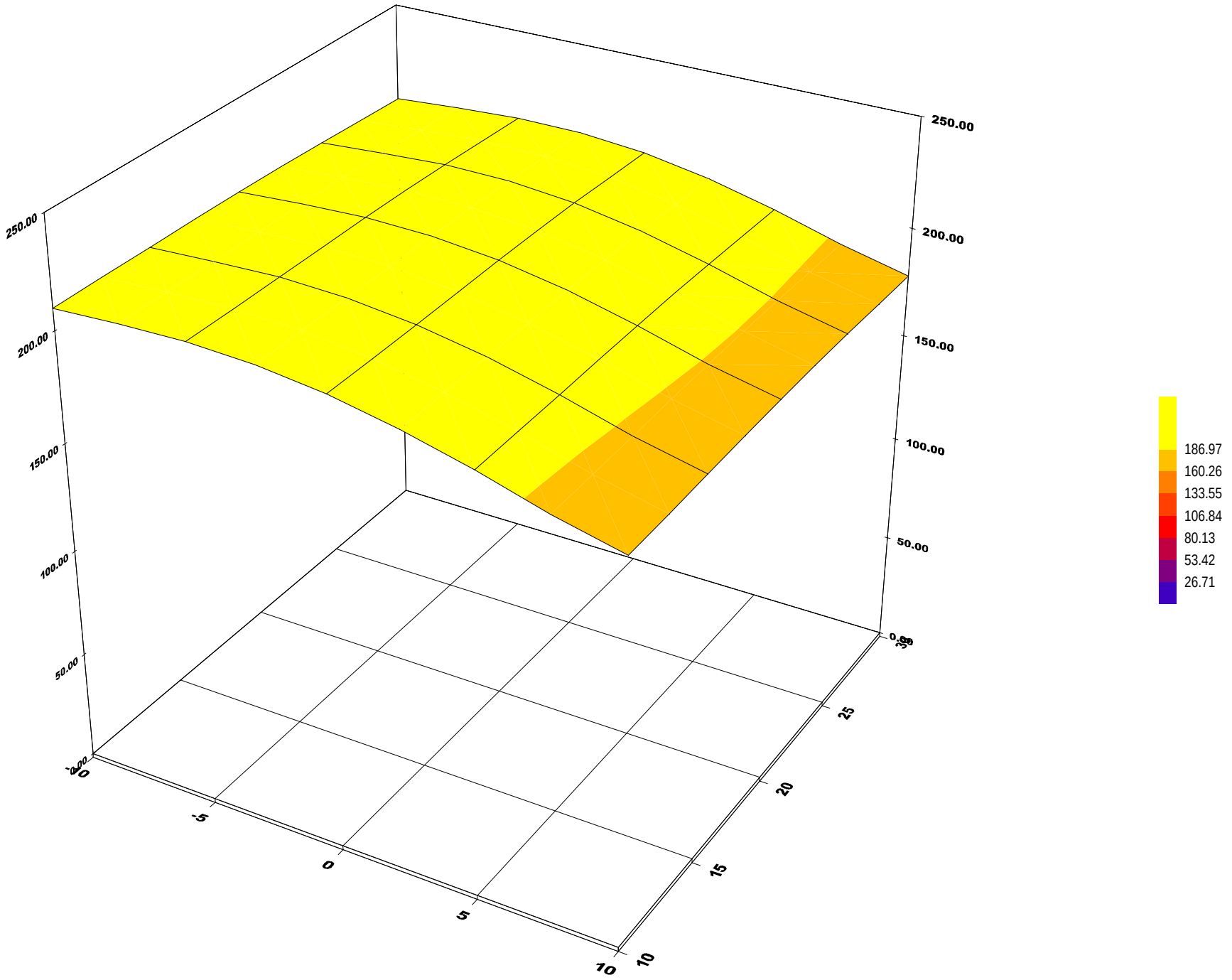
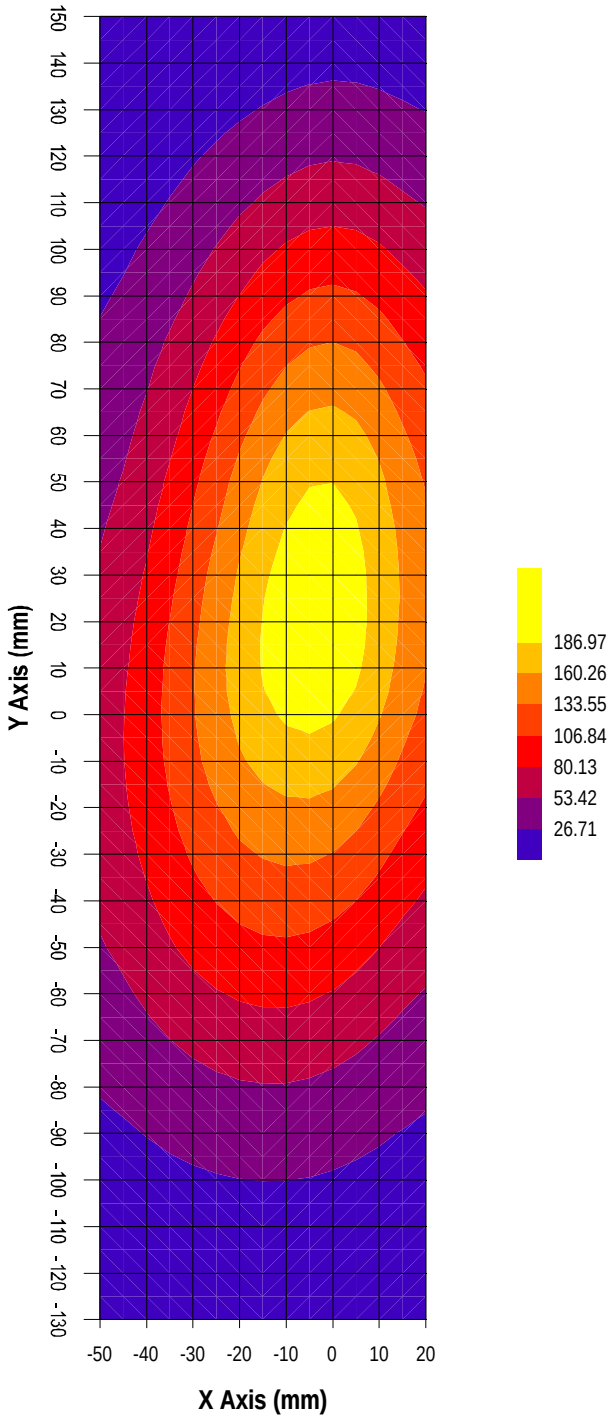
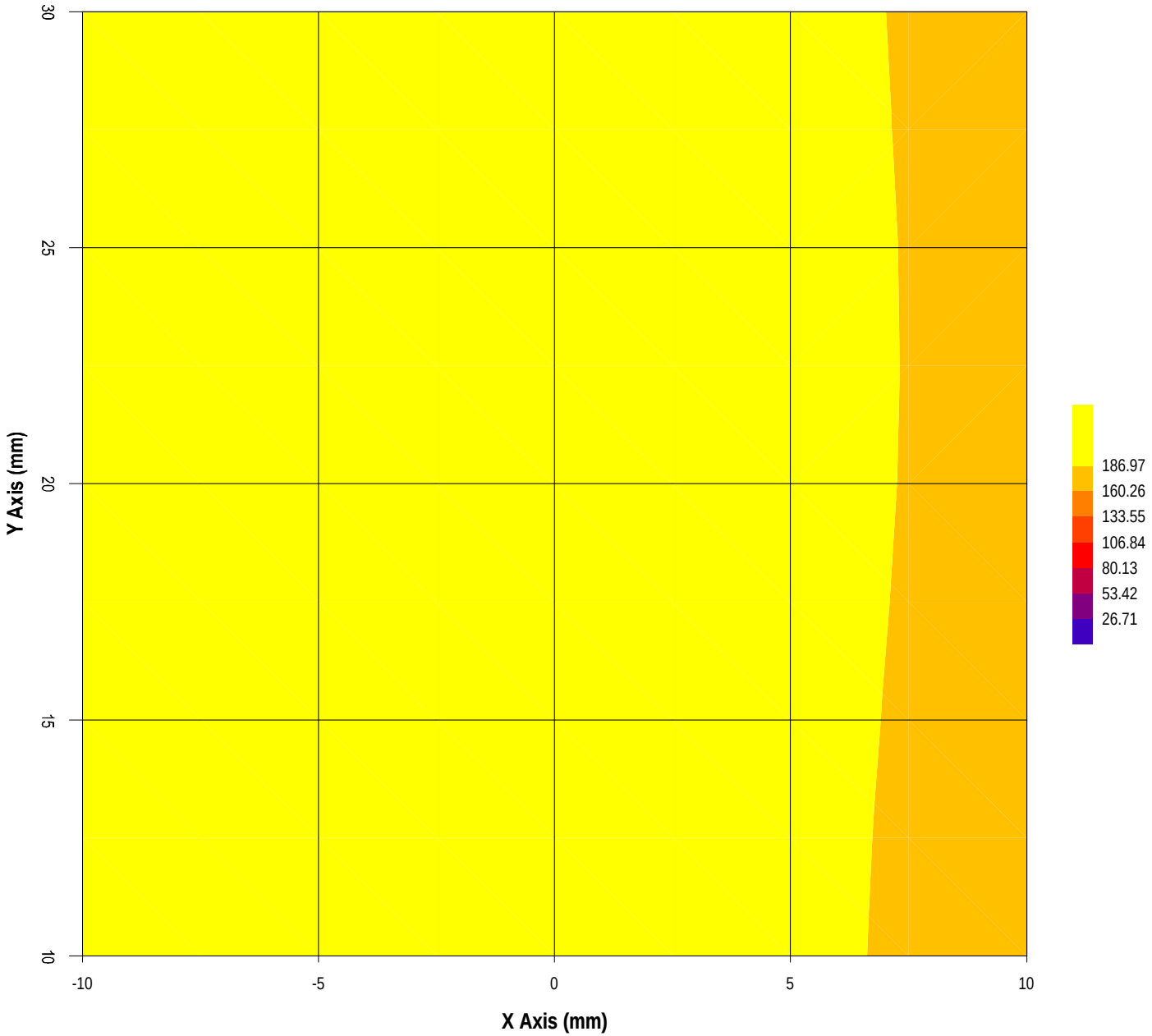
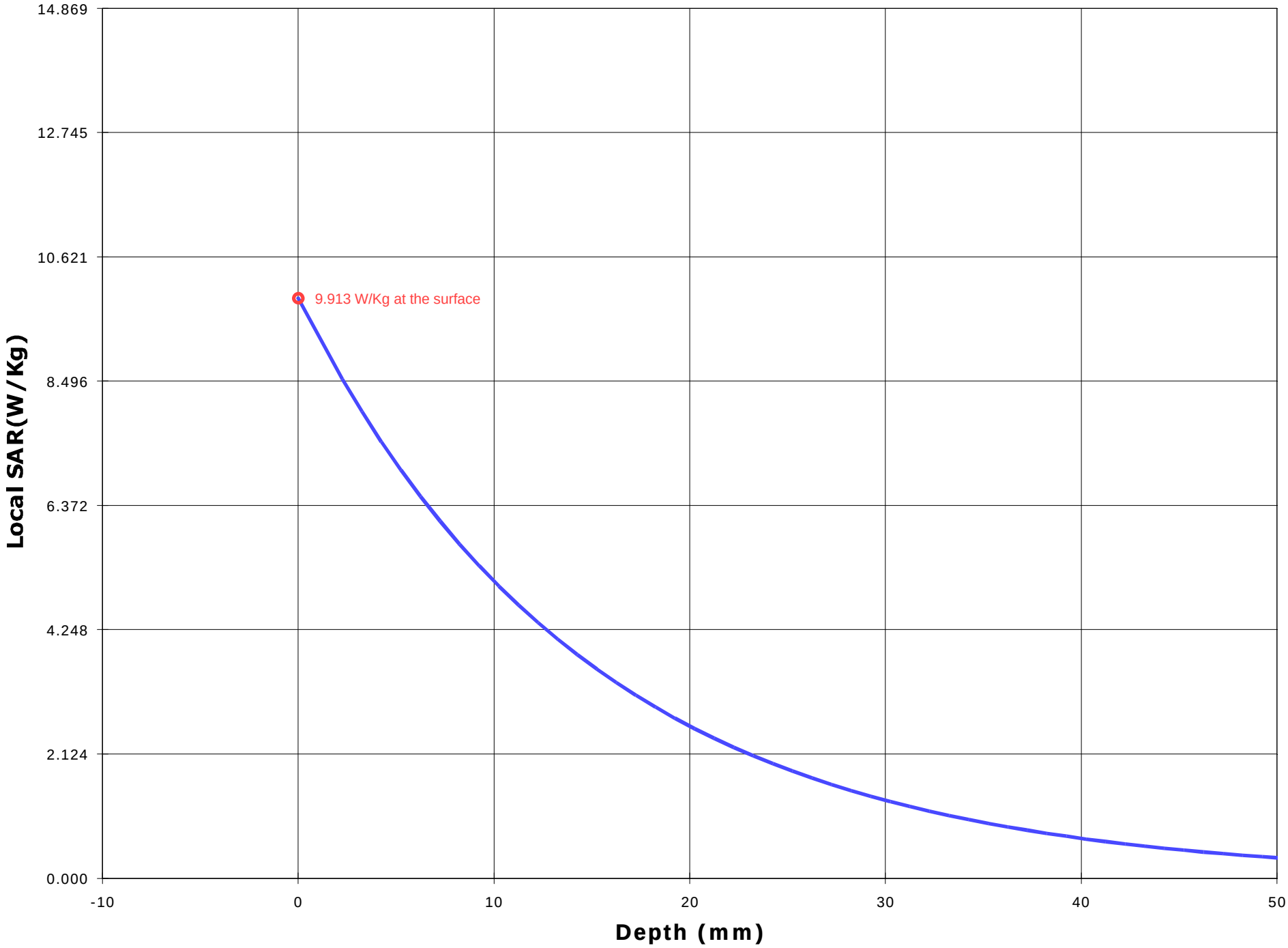
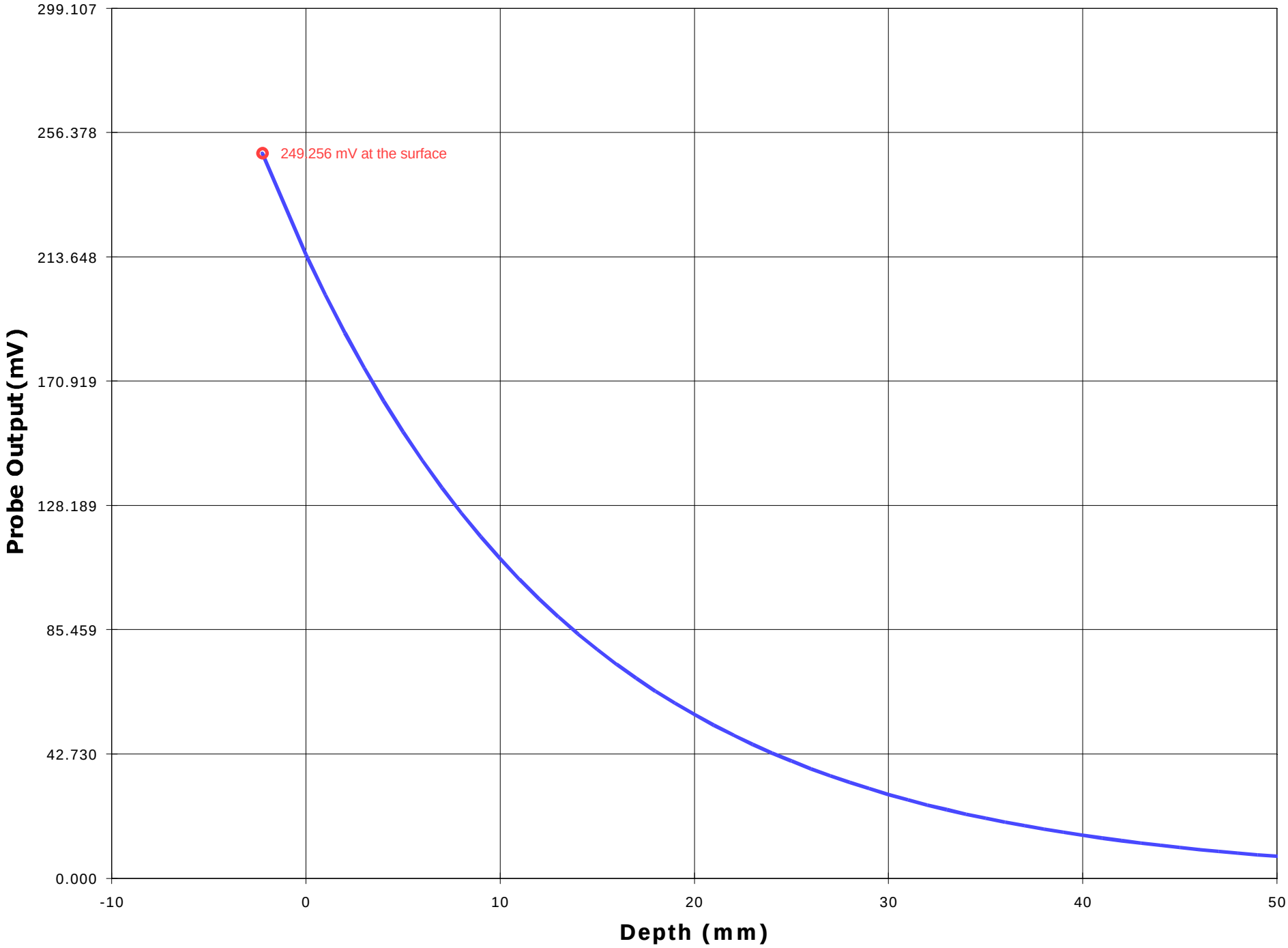
100.00
50.00
250.00
200.00
150.00
100.00
50.00
0.00
150
130
110
90
70
50
30
10
-10
-30
-50
-70
-90
-110
-130
-30
-10
10
186.97
160.26
133.55
106.84
80.13
53.42
26.71


250.00
200.00
150.00
100.00
50.00
0.00
-10
-5
0
5
10
15
20
25
30
186.97
160.26
133.55
106.84
80.13
53.42
26.71


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-50
-40
-30
-20
-10
0
10
20
X Axis (mm)
186.97
160.26
133.55
106.84
80.13
53.42
26.71


Y Axis (mm)
30
25
20
15
10
-10
-5
0
5
10
X Axis (mm)
186.97
160.26
133.55
106.84
80.13
53.42
26.71


14.869
12.745
10.621
8.496
6.372
4.248
2.124
0.000
Local SAR(W/Kg)
9.913 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


299.107
256.378
213.648
170.919
128.189
85.459
42.730
0.000
Probe Output (mV)
249.256 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 28/11/2001
Time : 6:39:43 PM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 400.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Head Front	**Dielectric Constant**	: 45.16
Simulated Tissue	: Brain	**Conductivity**	: 0.90

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.90
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.430	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.900

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

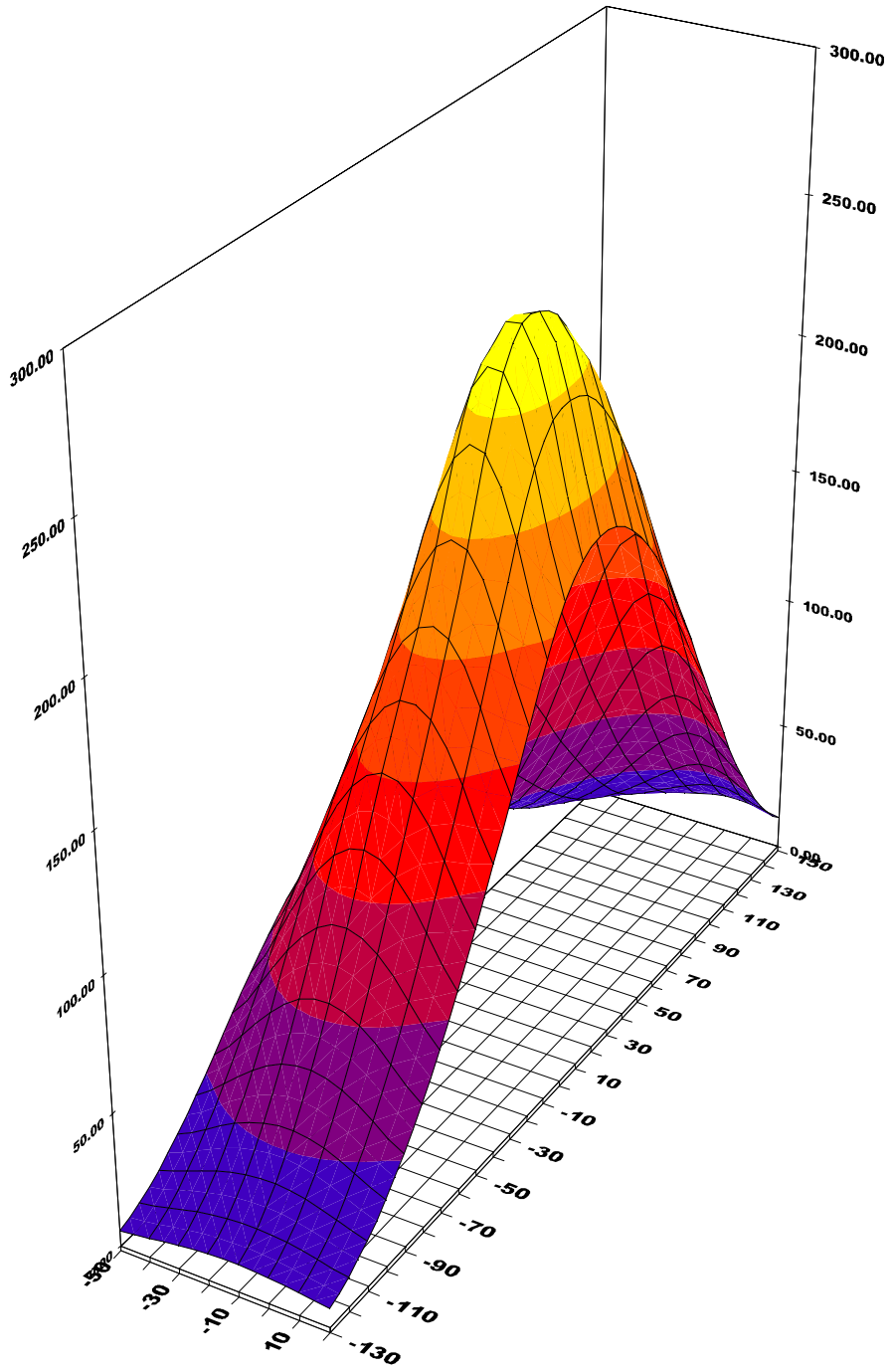
Location of Maximum Field :

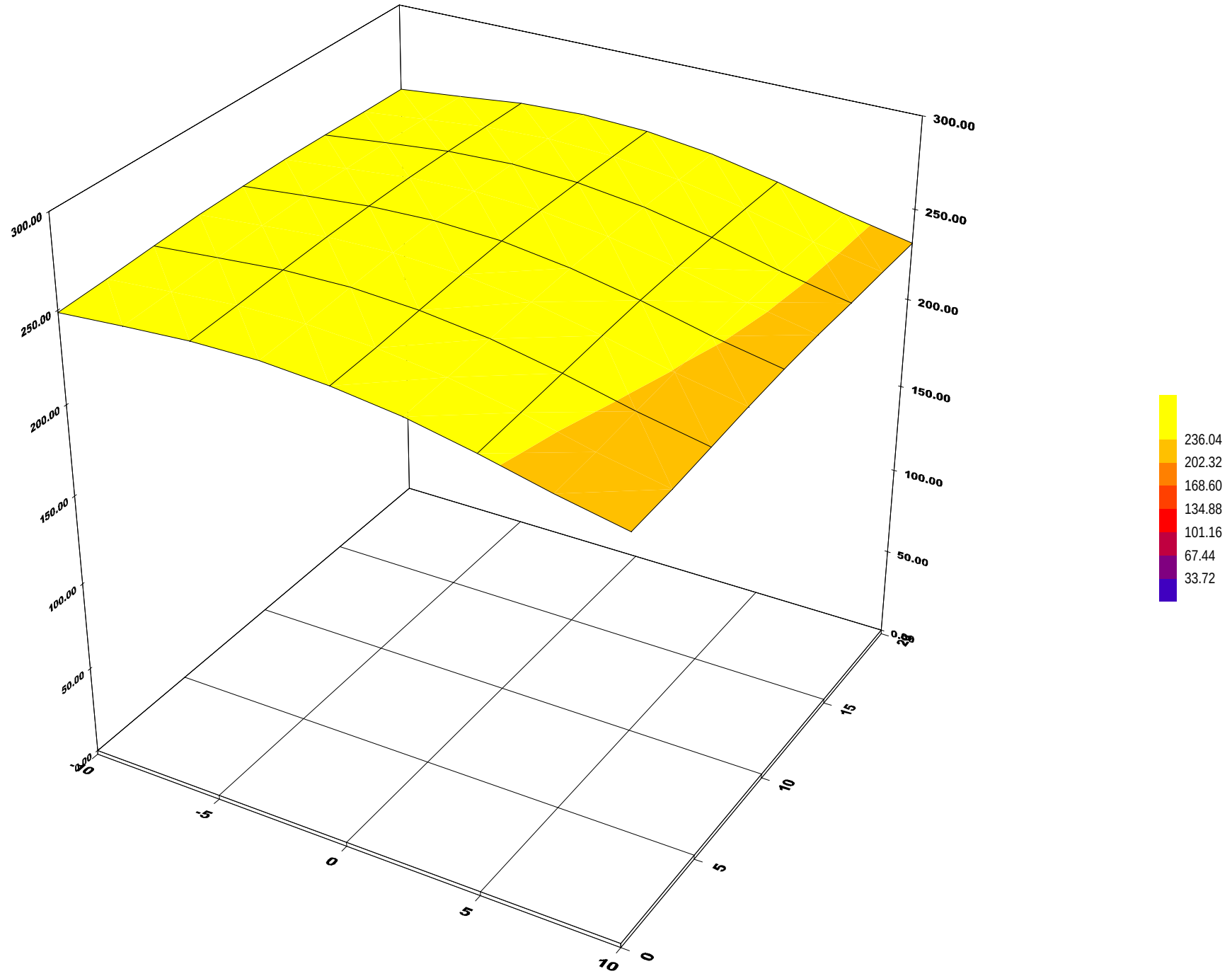
X = -5 Y = 15

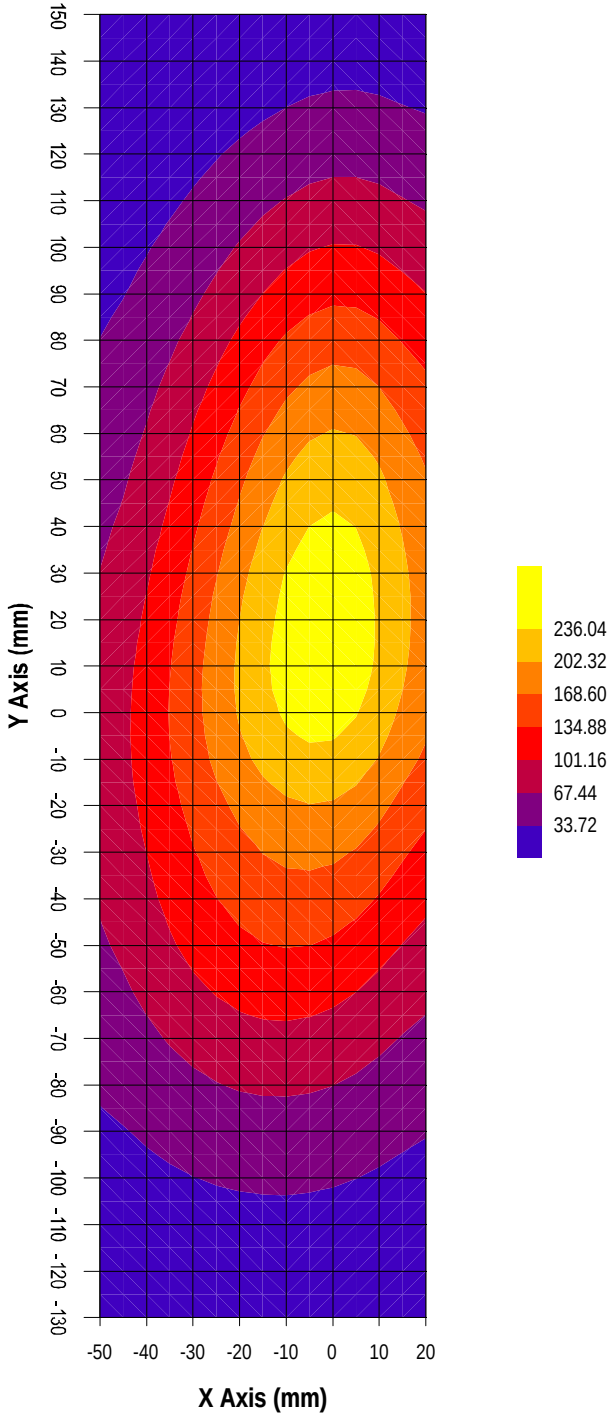
Measured Values (mV) :

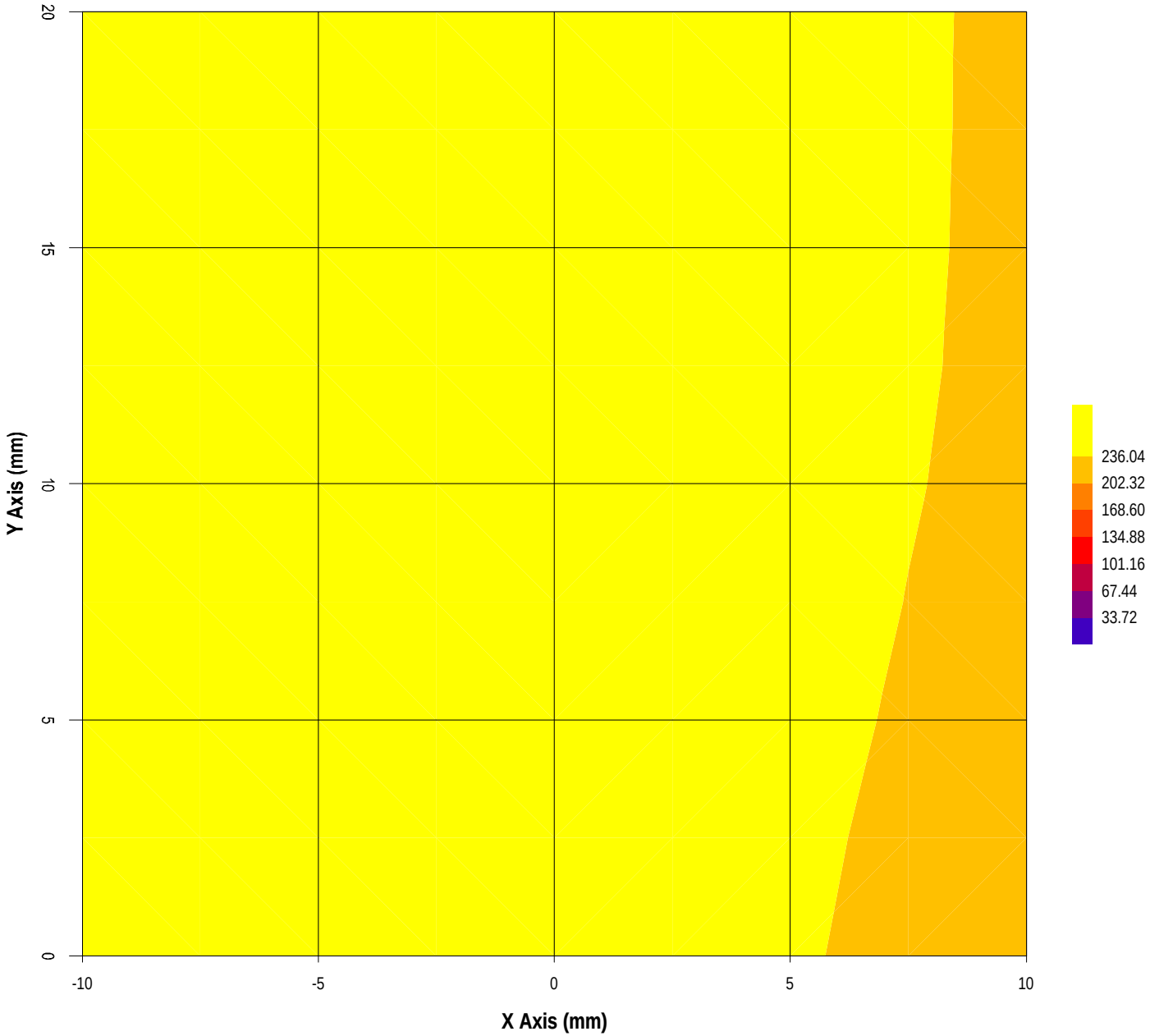
264.247	245.071	218.094	200.964	188.285	176.442
167.645	156.964	148.303	140.471	133.143	

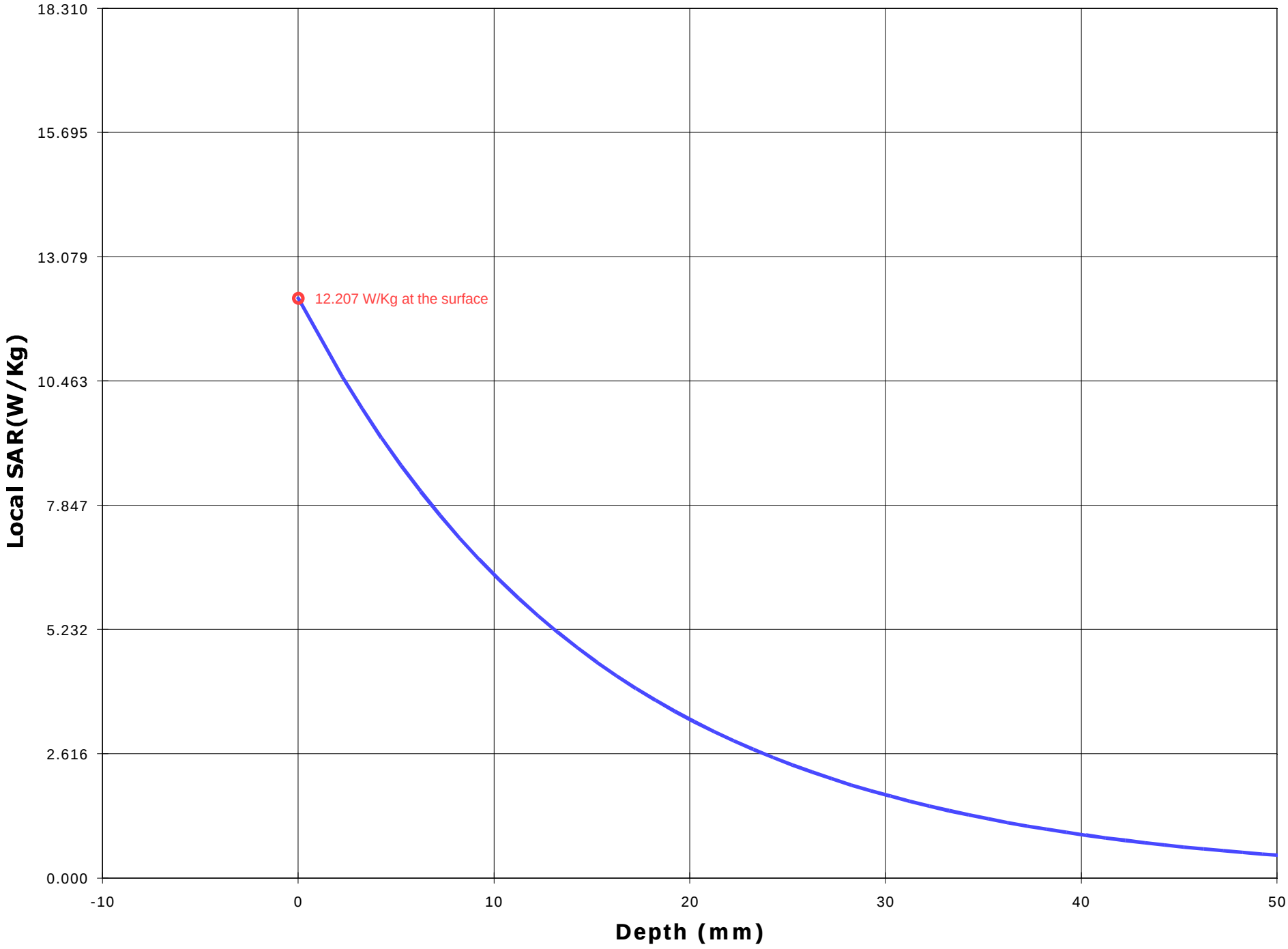
Peak Voltage (mV) : 306.951 **1 Cm Voltage (mV)** : 160.586 **SAR (W/Kg)** : 8.784

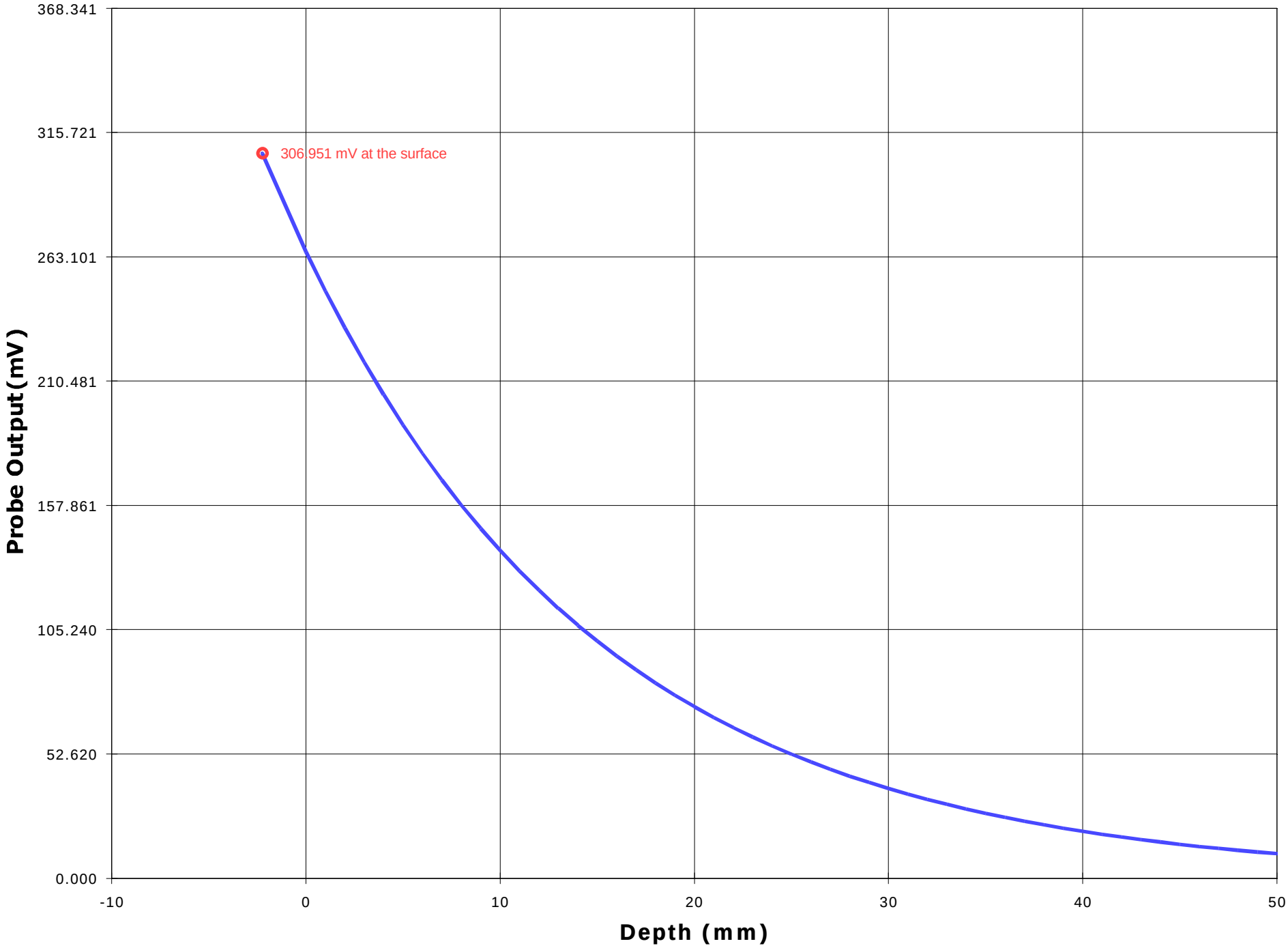

300.00
250.00
200.00
150.00
100.00
50.00
300.00
250.00
200.00
150.00
100.00
50.00
150
130
110
90
70
50
30
10
-10
-30
-50
-70
-90
-110
-130
-30
-10
10
236.04
202.32
168.60
134.88
101.16
67.44
33.72


300.00
250.00
200.00
150.00
100.00
50.00
0.00
-10
-5
0
5
10
0
5
10
15
20
300.00
250.00
200.00
150.00
100.00
50.00
0.00
236.04
202.32
168.60
134.88
101.16
67.44
33.72


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-50
-40
-30
-20
-10
0
10
20
X Axis (mm)
236.04
202.32
168.60
134.88
101.16
67.44
33.72


Y Axis (mm)
20
15
10
5
0
-10
-5
0
5
10
X Axis (mm)
236.04
202.32
168.60
134.88
101.16
67.44
33.72


18.310
15.695
13.079
10.463
7.847
5.232
2.616
0.000
Local SAR(W/Kg)
12.207 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


368.341
315.721
263.101
210.481
157.861
105.240
52.620
0.000
Probe Output (mV)
306.951 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 29/11/2001
Time : 10:13:53 AM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 415.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Head Front	**Dielectric Constant**	: 45.16
Simulated Tissue	: Brain	**Conductivity**	: 0.90

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.97
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.430	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.970

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

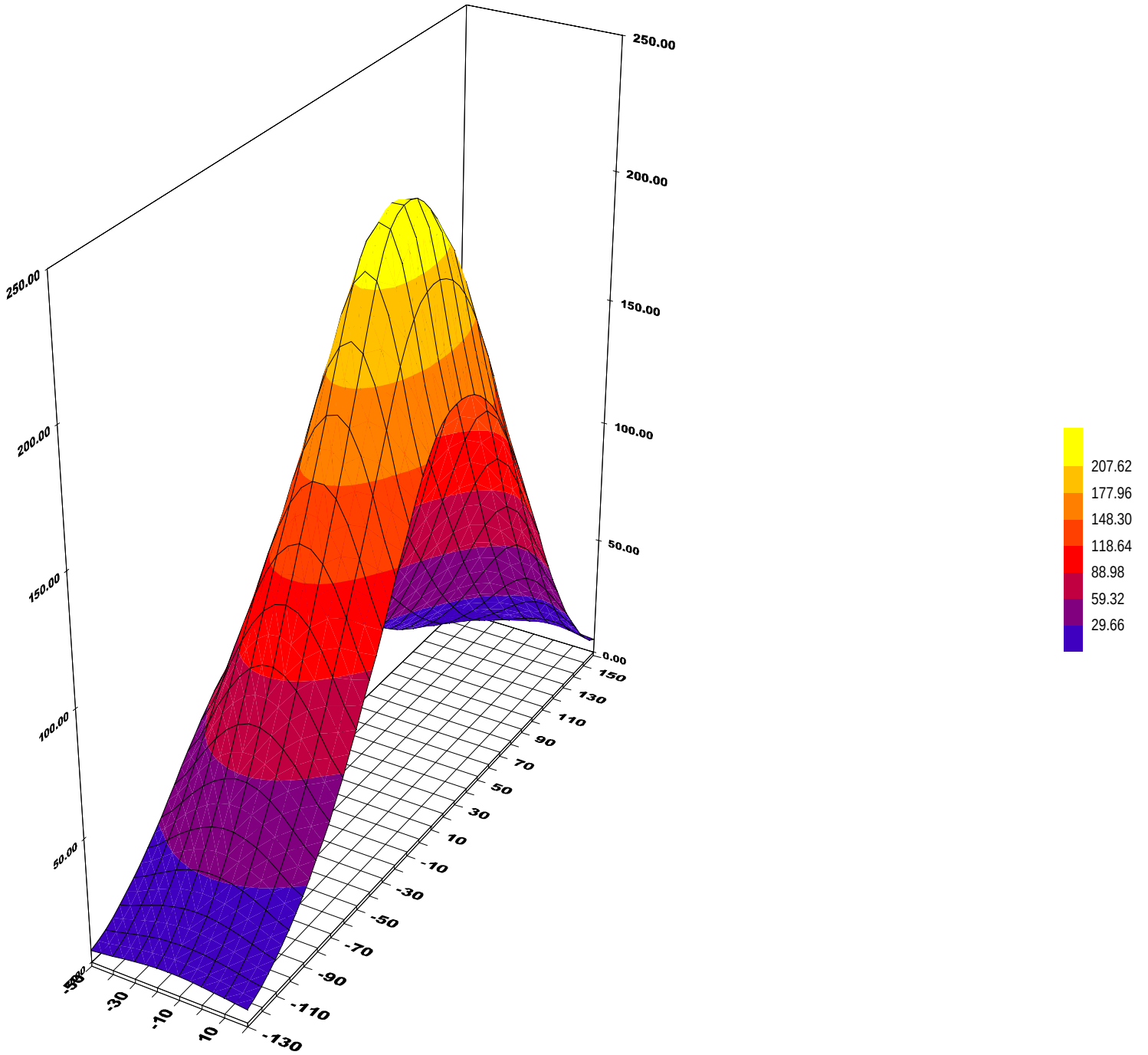
Location of Maximum Field :

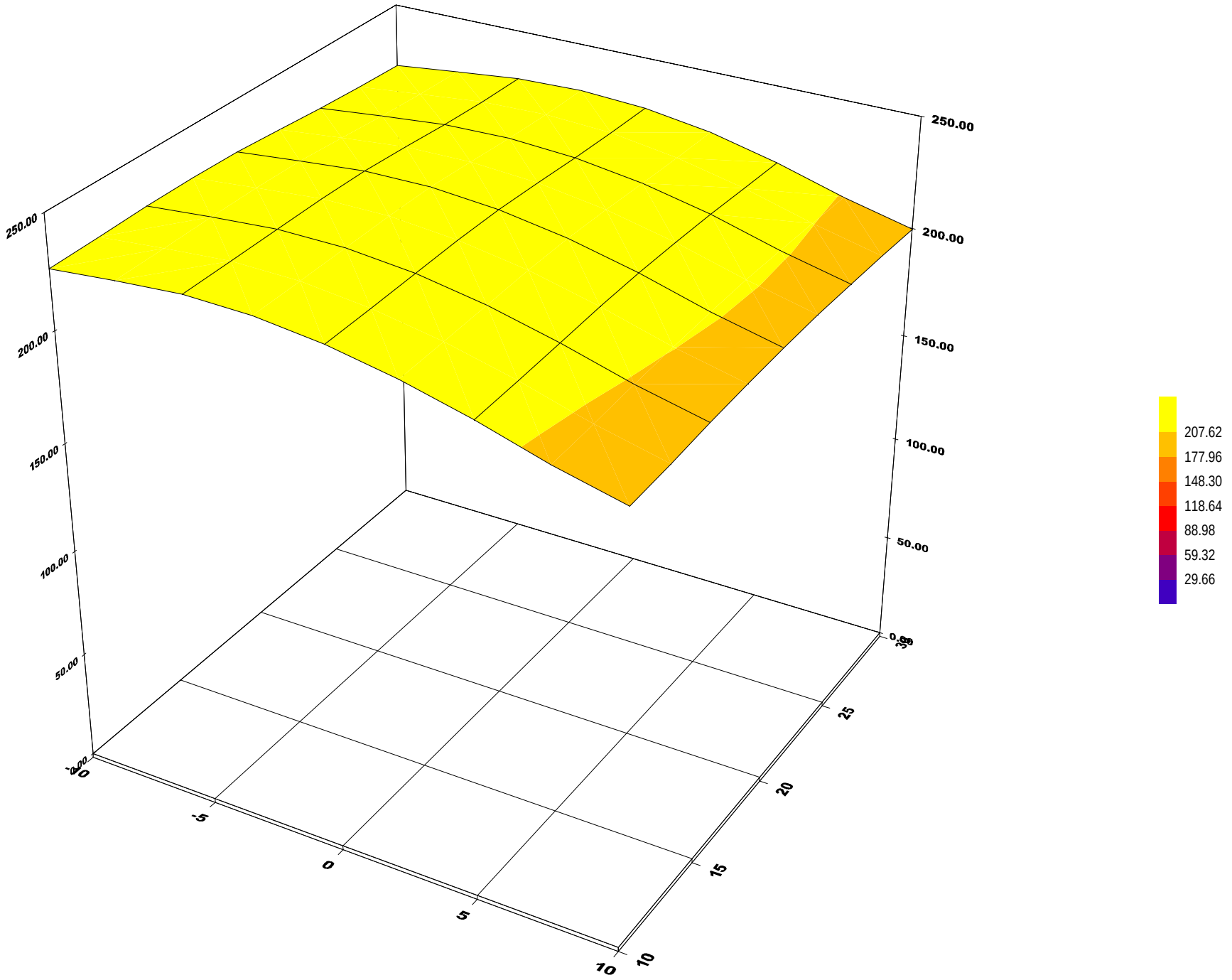
X = -5 Y = 20

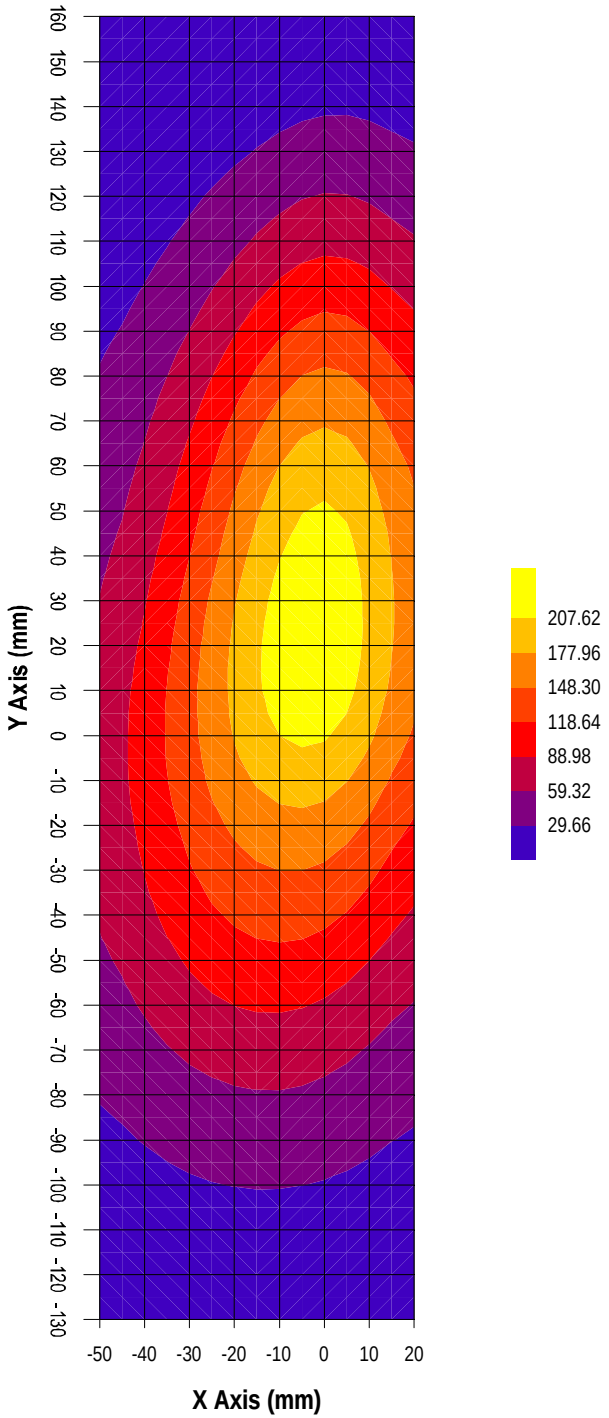
Measured Values (mV) :

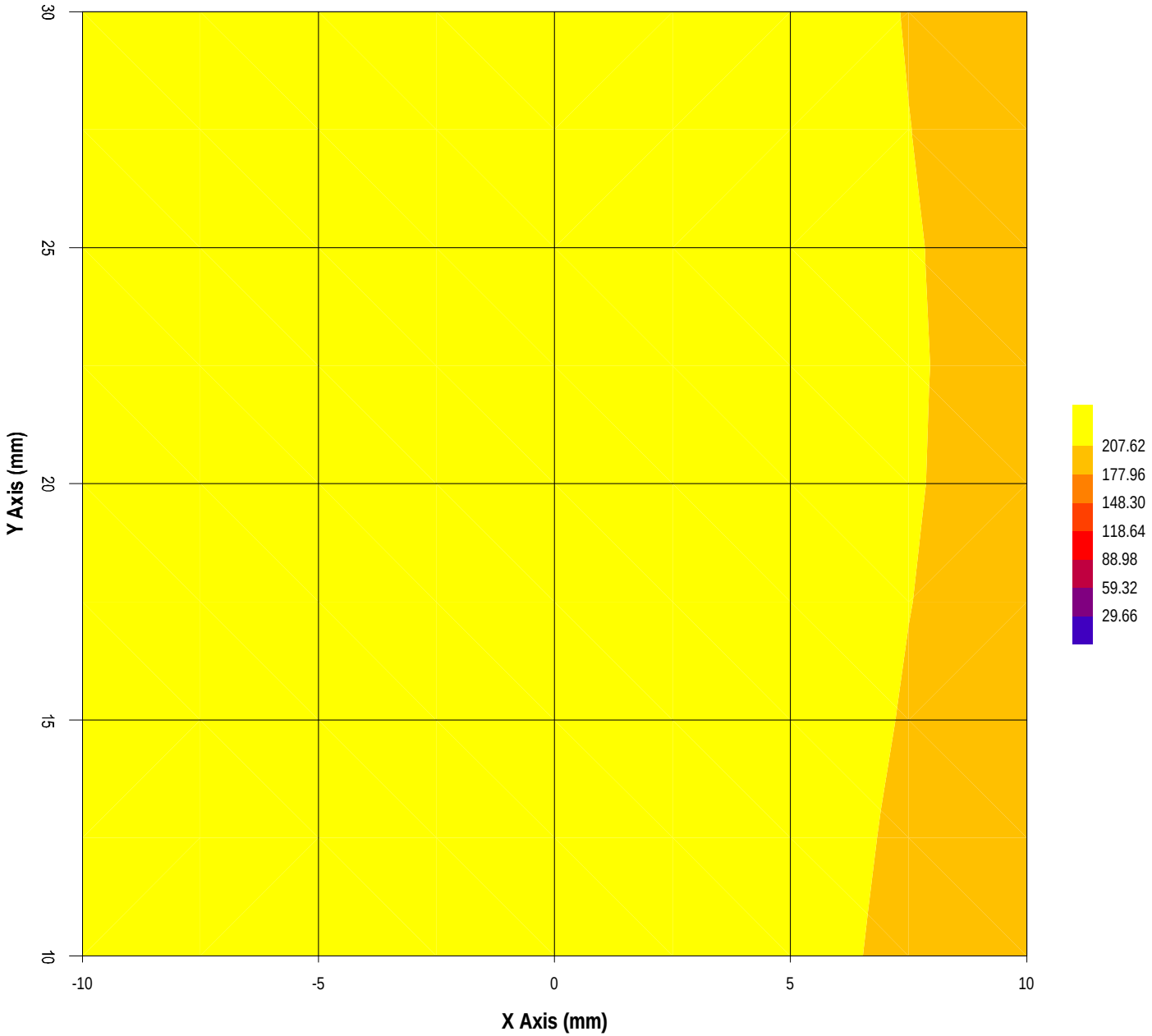
231.518	217.810	193.765	177.100	165.588	155.727
145.921	138.718	131.405	123.794	117.784	

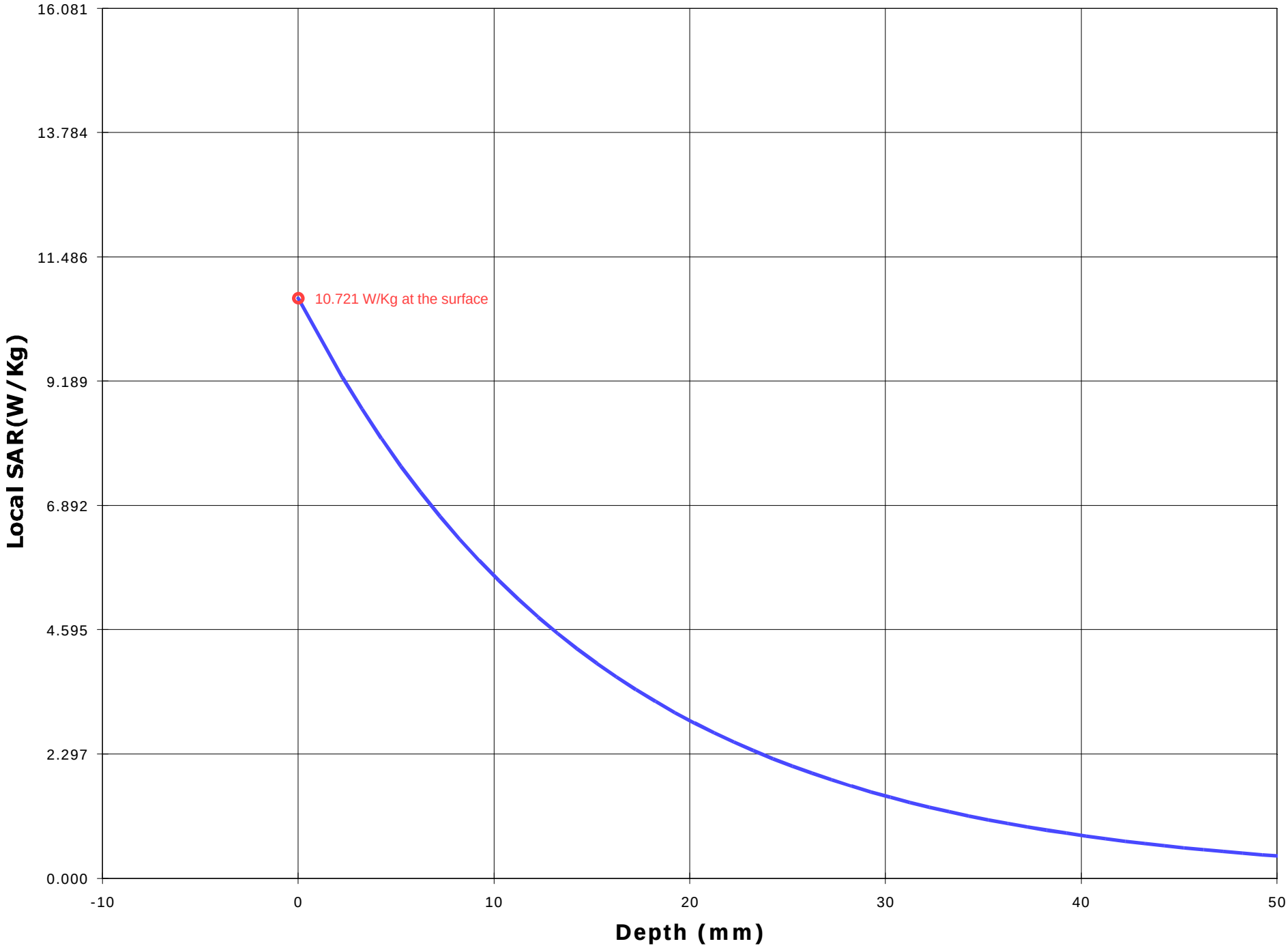
Peak Voltage (mV) : 269.575 **1 Cm Voltage (mV)** : 140.599 **SAR (W/Kg)** : 7.826

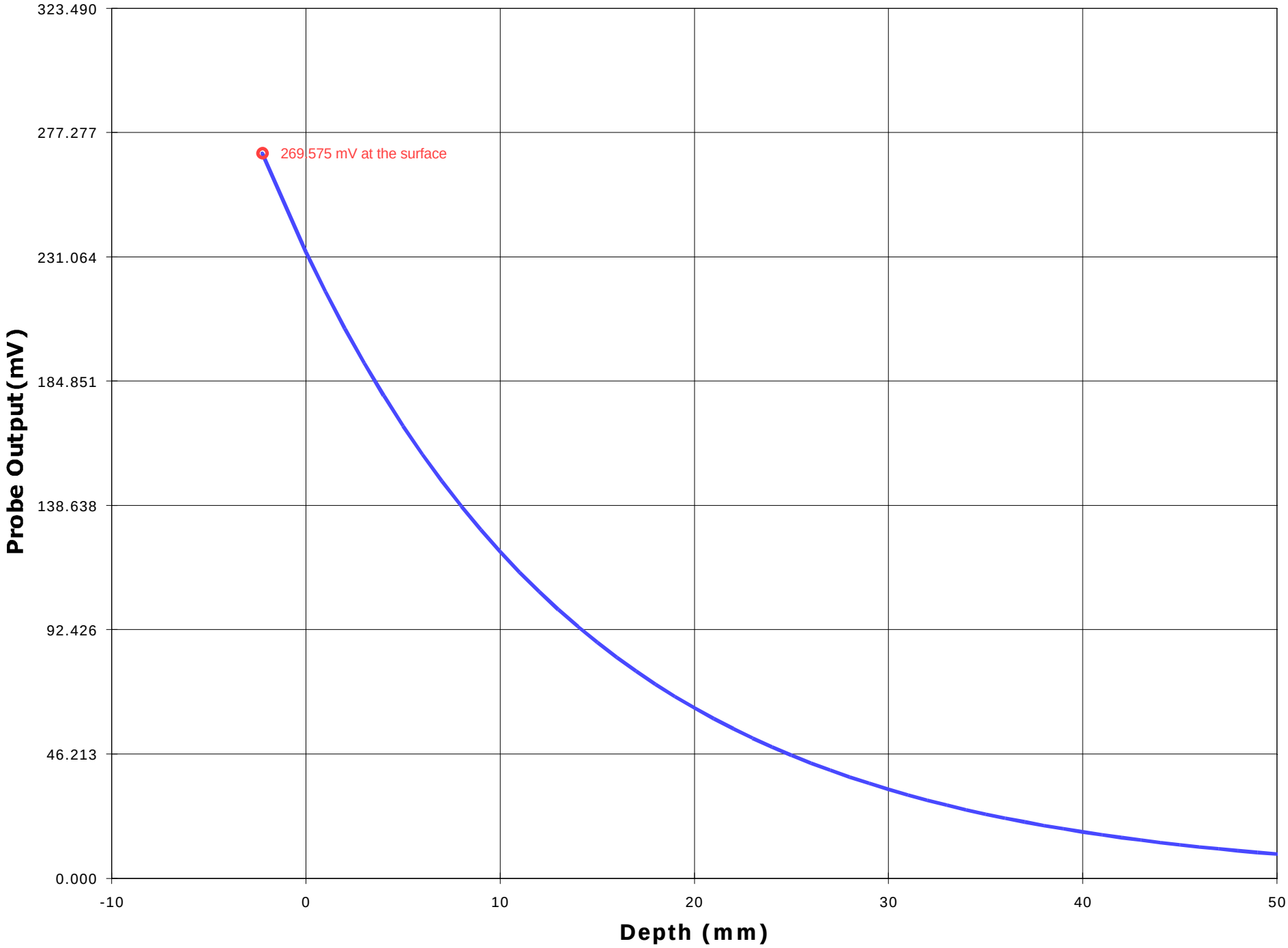

250.00
200.00
150.00
100.00
50.00
0.00
150
130
110
90
70
50
30
10
-10
-30
-50
-70
-90
-110
-130
-30
-10
10
207.62
177.96
148.30
118.64
88.98
59.32
29.66


250.00
200.00
150.00
100.00
50.00
-10.00
-5
0
5
10
15
20
25
30
207.62
177.96
148.30
118.64
88.98
59.32
29.66


Y Axis (mm)
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-50
-40
-30
-20
-10
0
10
20
X Axis (mm)
207.62
177.96
148.30
118.64
88.98
59.32
29.66


Y Axis (mm)
30
25
20
15
10
-10
-5
0
5
10
X Axis (mm)
207.62
177.96
148.30
118.64
88.98
59.32
29.66


16.081
13.784
11.486
9.189
6.892
4.595
2.297
0.000
Local SAR(W/Kg)
10.721 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


323.490
277.277
231.064
184.851
138.638
92.426
46.213
0.000
Probe Output (mV)
269.575 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 29/11/2001
Time : 10:46:03 AM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 429.95
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Head Front	**Dielectric Constant**	: 45.16
Simulated Tissue	: Brain	**Conductivity**	: 0.90

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 4.08
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.430	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 4.080

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

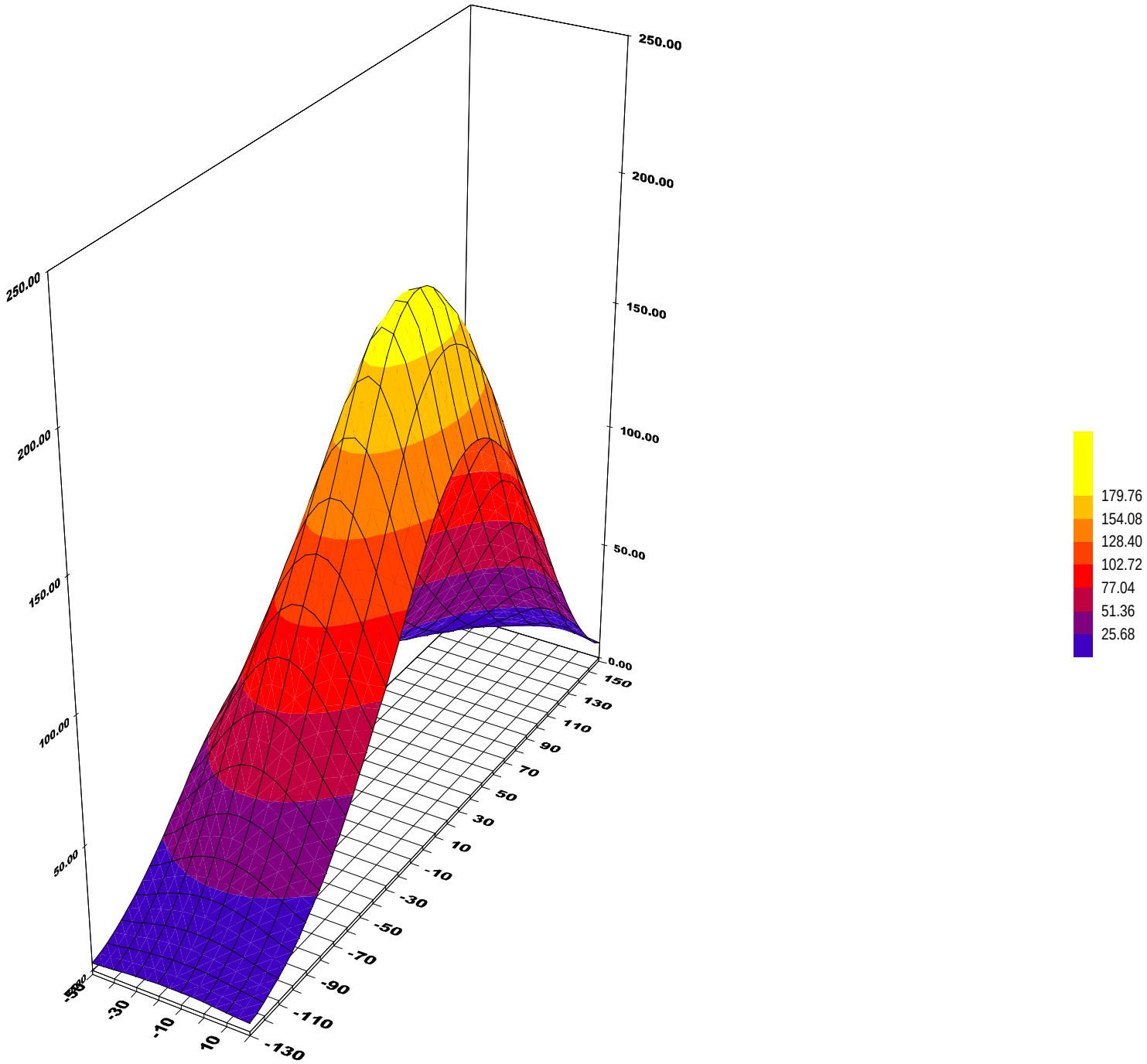
Location of Maximum Field :

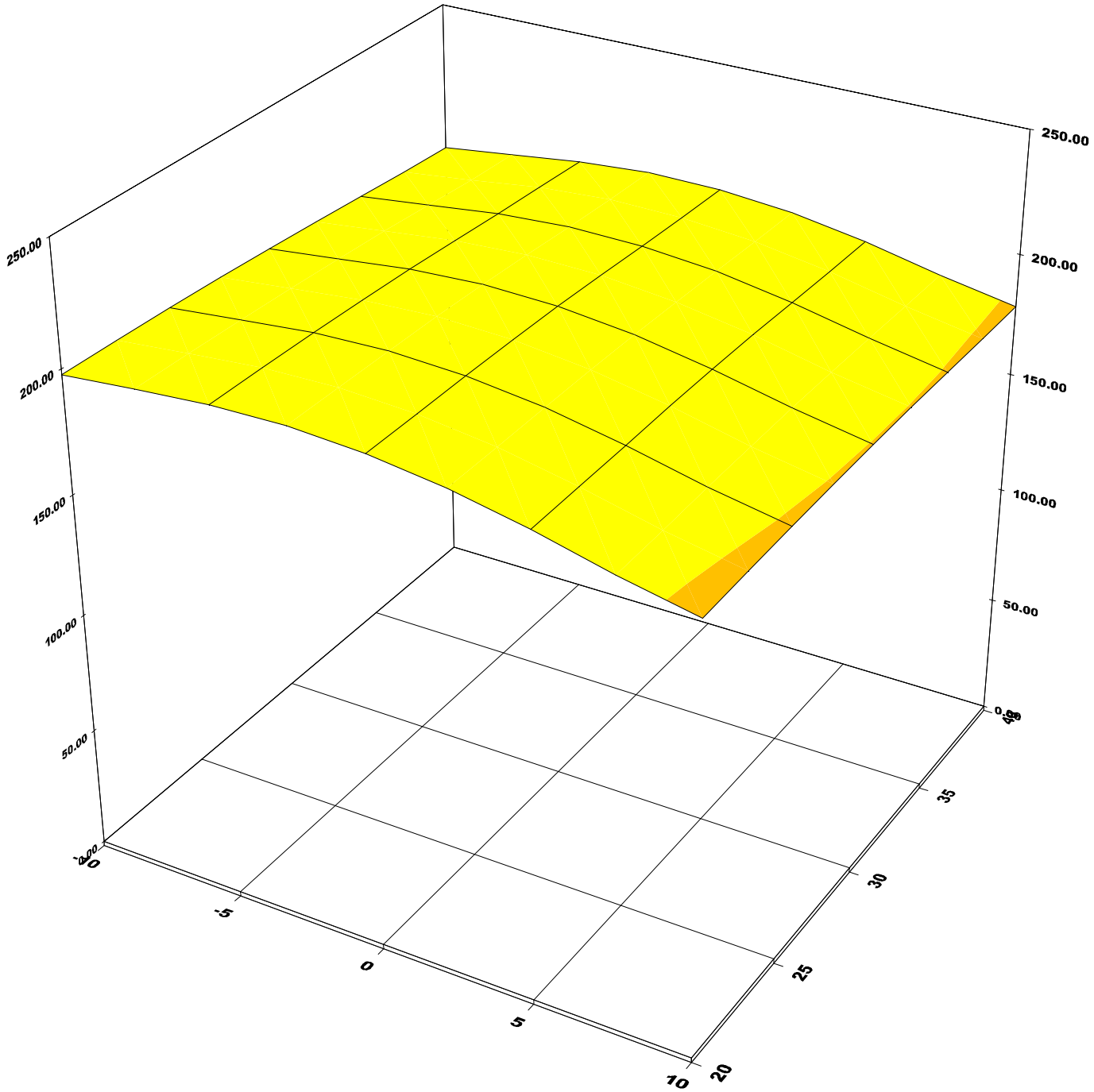
X = -5 Y = 20

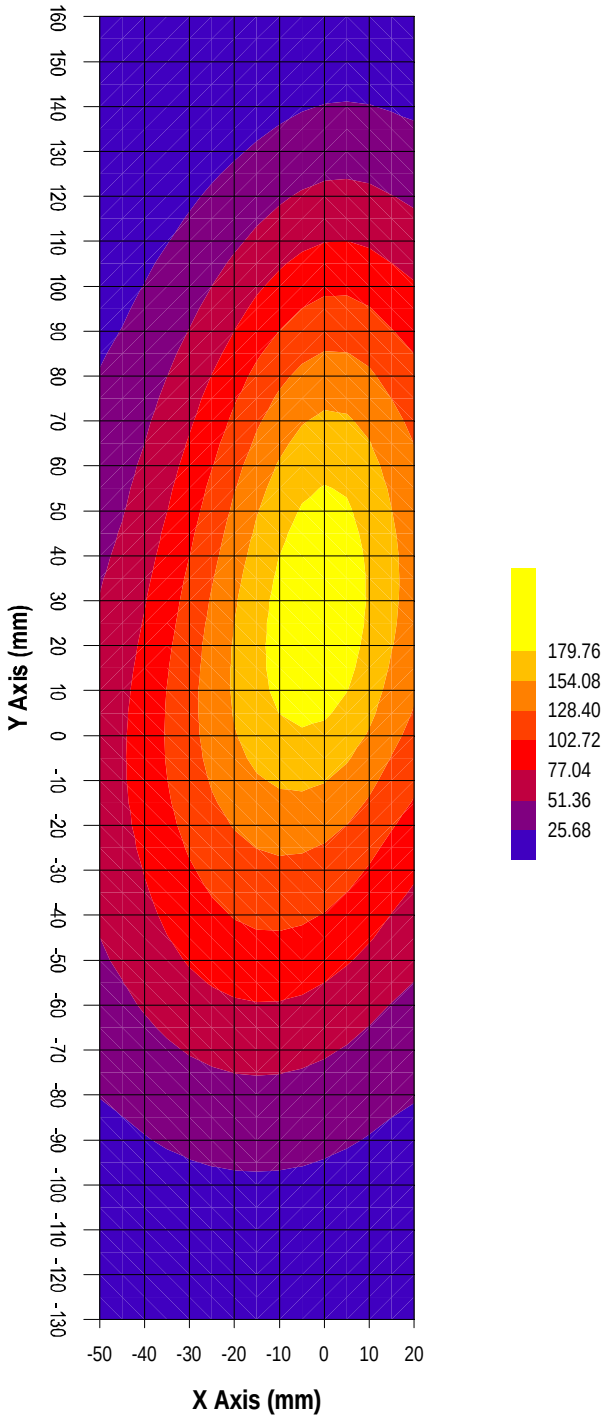
Measured Values (mV) :

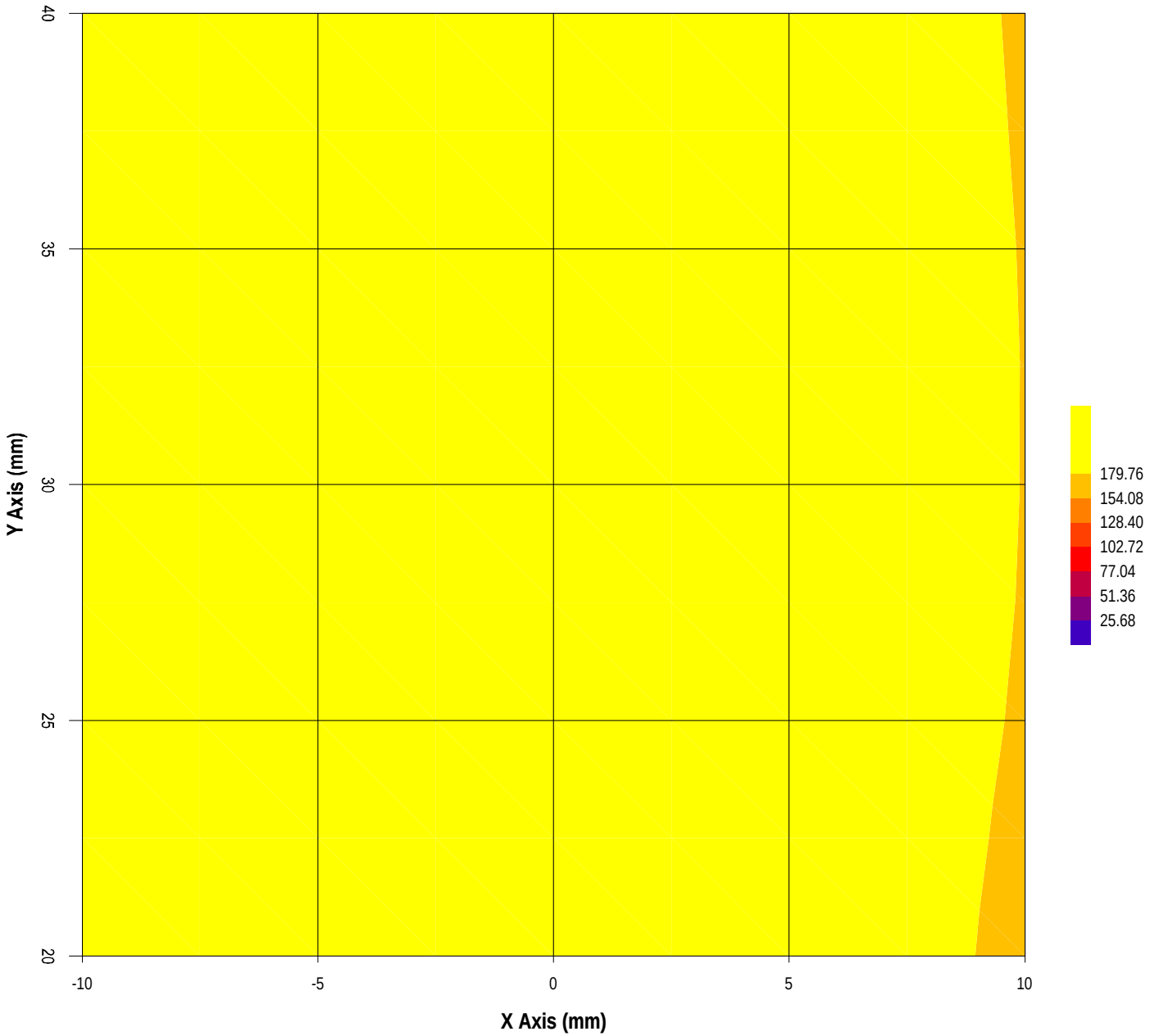
202.864	189.353	160.914	154.400	143.682	136.660
128.556	120.517	113.952	106.869	101.974	

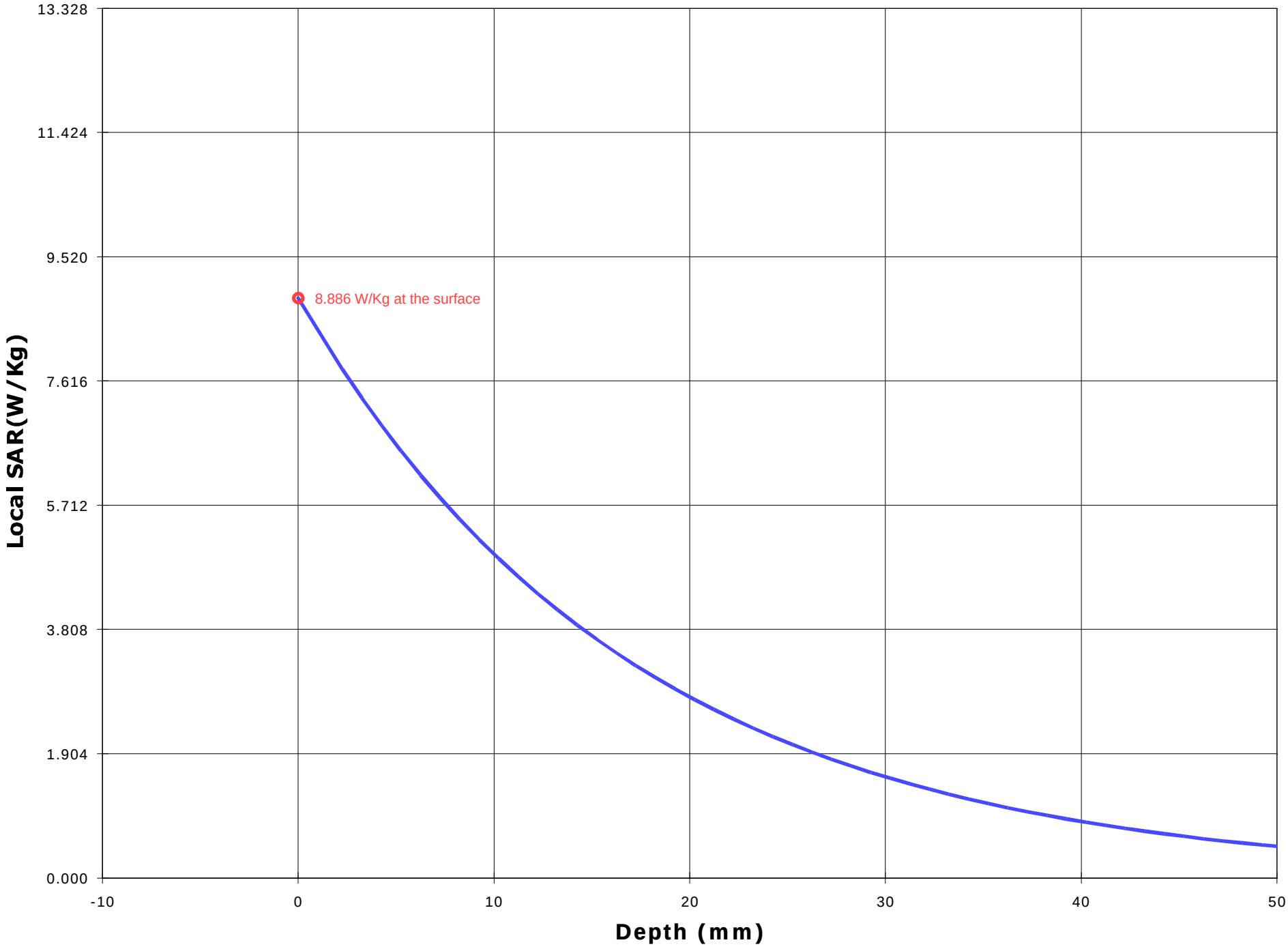
Peak Voltage (mV) : 223.432 **1 Cm Voltage (mV)** : 124.822 **SAR (W/Kg)** : 6.924


250.00
200.00
150.00
100.00
50.00
250.00
200.00
150.00
100.00
50.00
0.00
150
130
110
90
70
50
30
10
-10
-30
-50
-70
-90
-110
-130
-30
-10
10
179.76
154.08
128.40
102.72
77.04
51.36
25.68


250.00
200.00
150.00
100.00
50.00
0.00
-10
-5
0
5
10
20
25
30
35
40
179.76
154.08
128.40
102.72
77.04
51.36
25.68


Y Axis (mm)
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-50
-40
-30
-20
-10
0
10
20
X Axis (mm)
179.76
154.08
128.40
102.72
77.04
51.36
25.68


Y Axis (mm)
40
35
30
25
20
-10
-5
0
5
10
X Axis (mm)
179.76
154.08
128.40
102.72
77.04
51.36
25.68


13.328
11.424
9.520
7.616
5.712
3.808
1.904
0.000
Local SAR(W/Kg)
8.886 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)

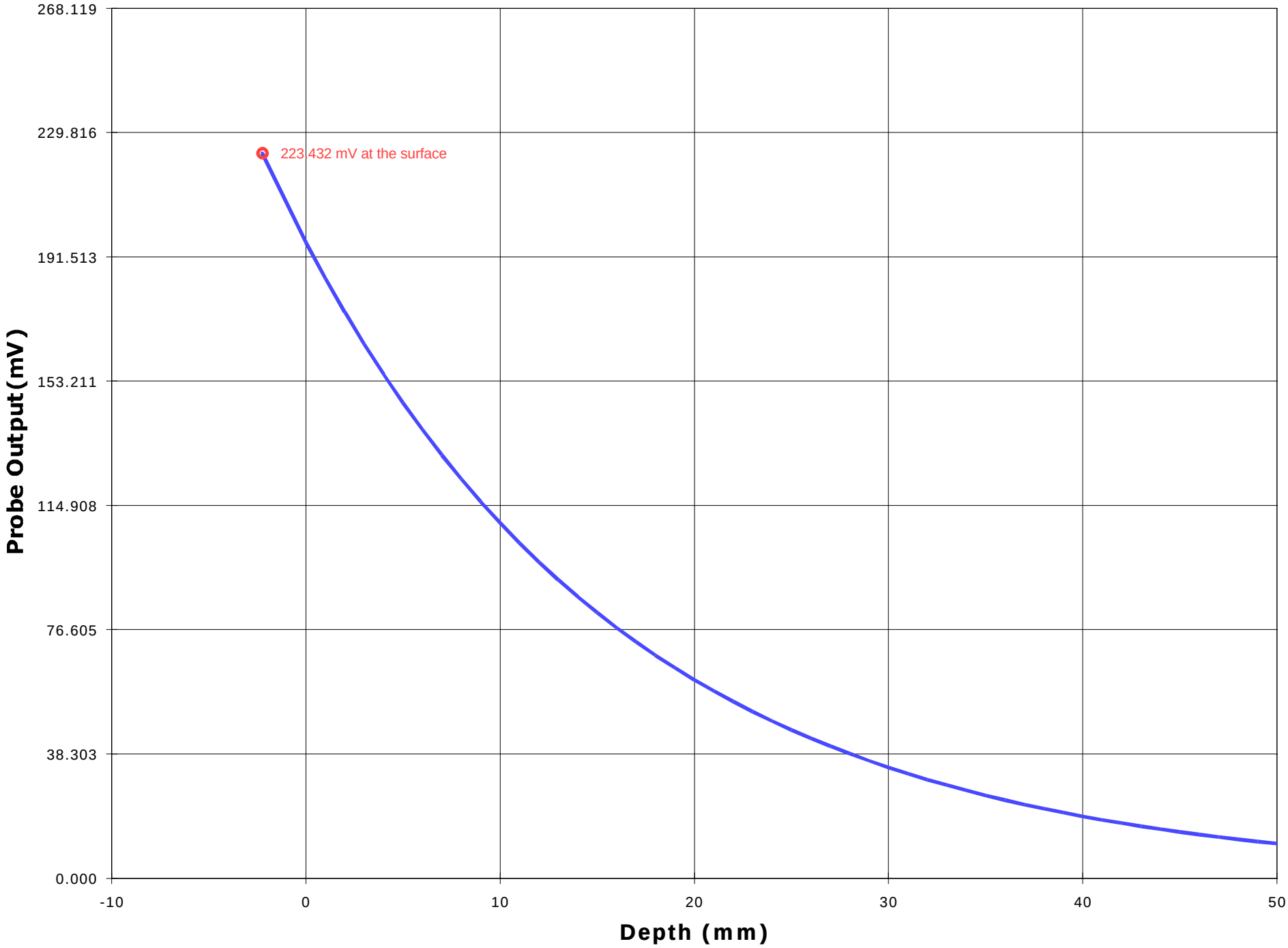

268.119
229.816
191.513
153.211
114.908
76.605
38.303
0.000
Probe Output (mV)
223.432 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

EXHIBIT 8. TEST RESULTS OF BODY-WORN CONFIGURATION WITH M/N: BP-210 BATTERY PACK, M/N: MB-68 BELT CLIP AND M/N: HS-51 HEADSET

Test results of body-worn configuration are presented in following order:

Test Configuration	Frequency (MHz)	SAR (W/Kg)	Location of hot spot (mm) * Base of antenna as reference point (0, 0)
EUT parallel to the phantom	400.05 NB (CH1)	5.754 (11.507)	(0, 15)
	415.05 NB (CH2)	4.908 (9.816)	(0, 15)
	429.95 NB (CH3)	4.440 (8.880)	(0, 25)
	400.05 WB (CH4)	**5.870 (11.740)**	**(0. 25)**
	415.05 WB (CH5)	4.954 (9.907)	(0, 20)
	429.95 WB (CH6)	4.750 (9.500)	(0, 20)

*** The SAR Measurement inside the parenthesis indicates the reading before 50 % duty factor is applied for the half-duplex type PTT**

Test Information

Date : 30/11/2001
Time : 5:35:11 PM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 400.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Waist	**Dielectric Constant**	: 56.84
Simulated Tissue	: Muscle	**Conductivity**	: 0.92

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.92
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.642	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.920

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

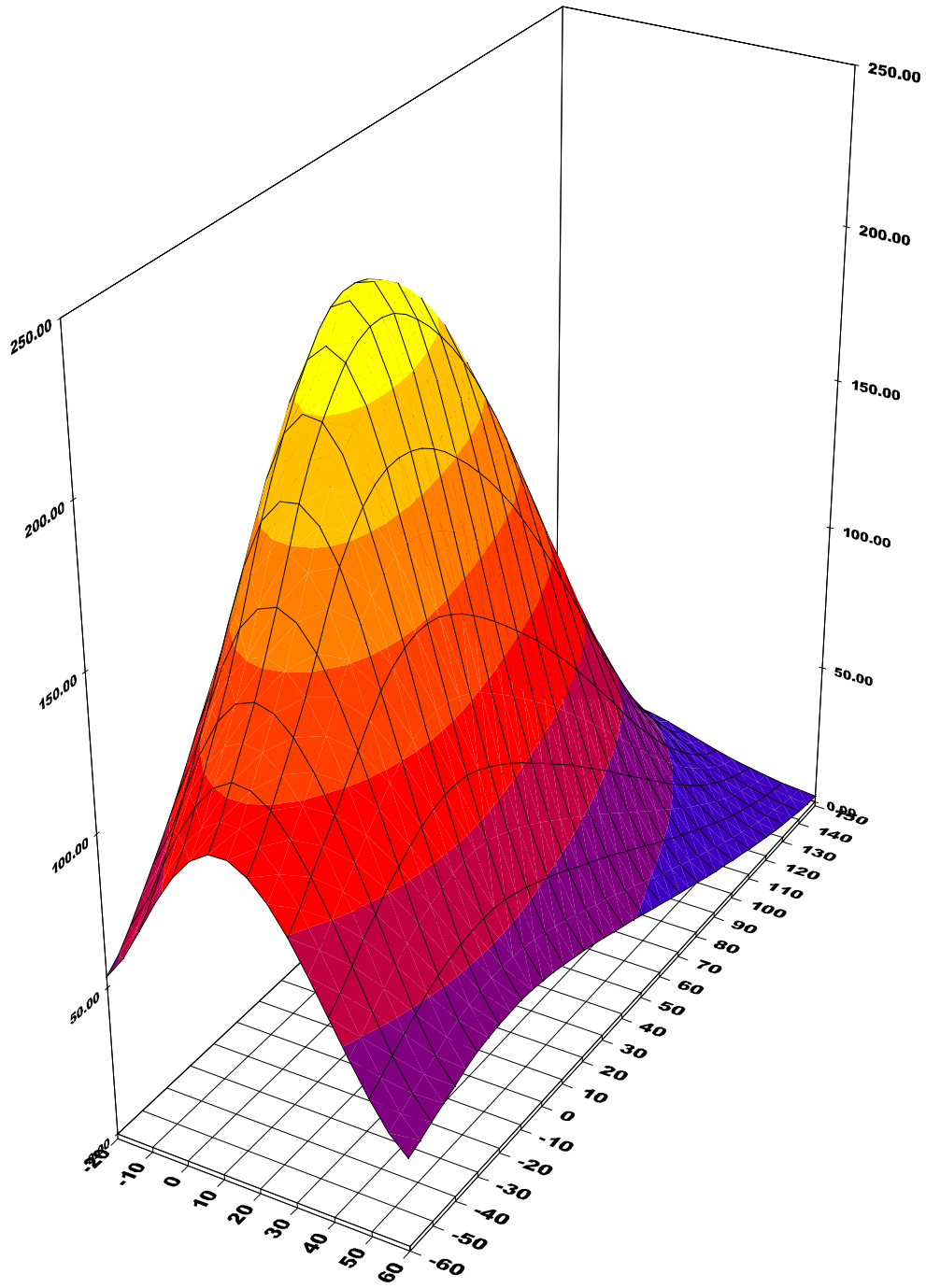
Location of Maximum Field :

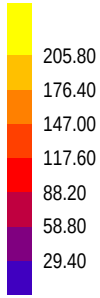
X = 0 Y = 15

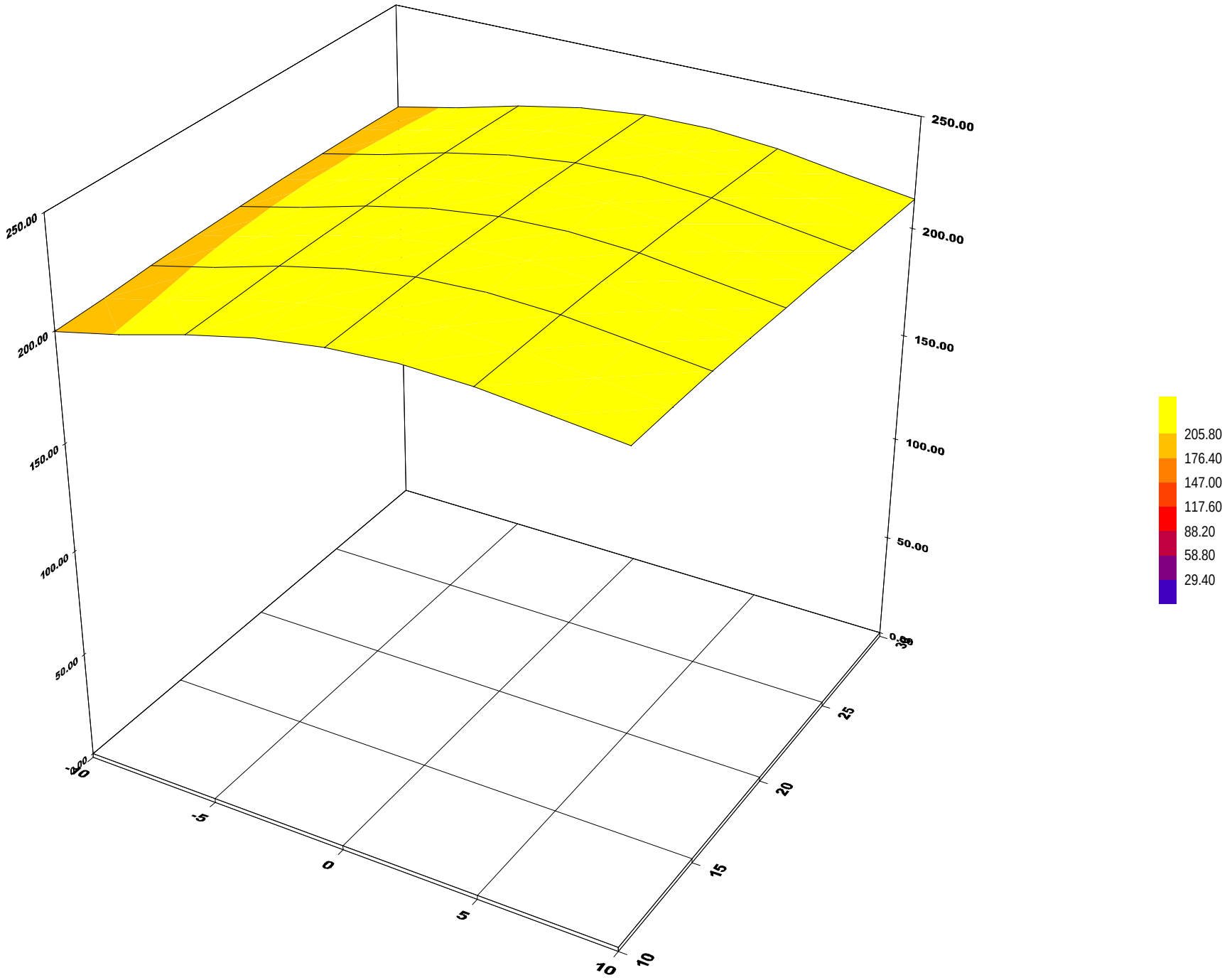
Measured Values (mV) :

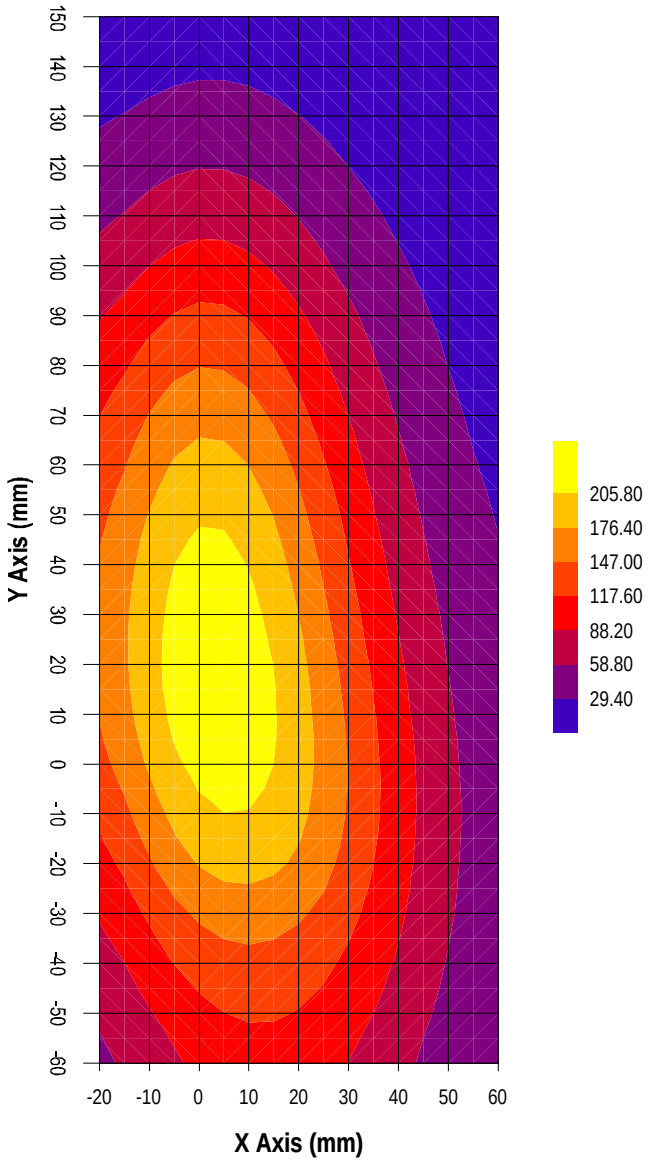
228.808	211.204	189.547	175.738	165.651	155.502
146.712	137.759	130.315	123.706	117.606	

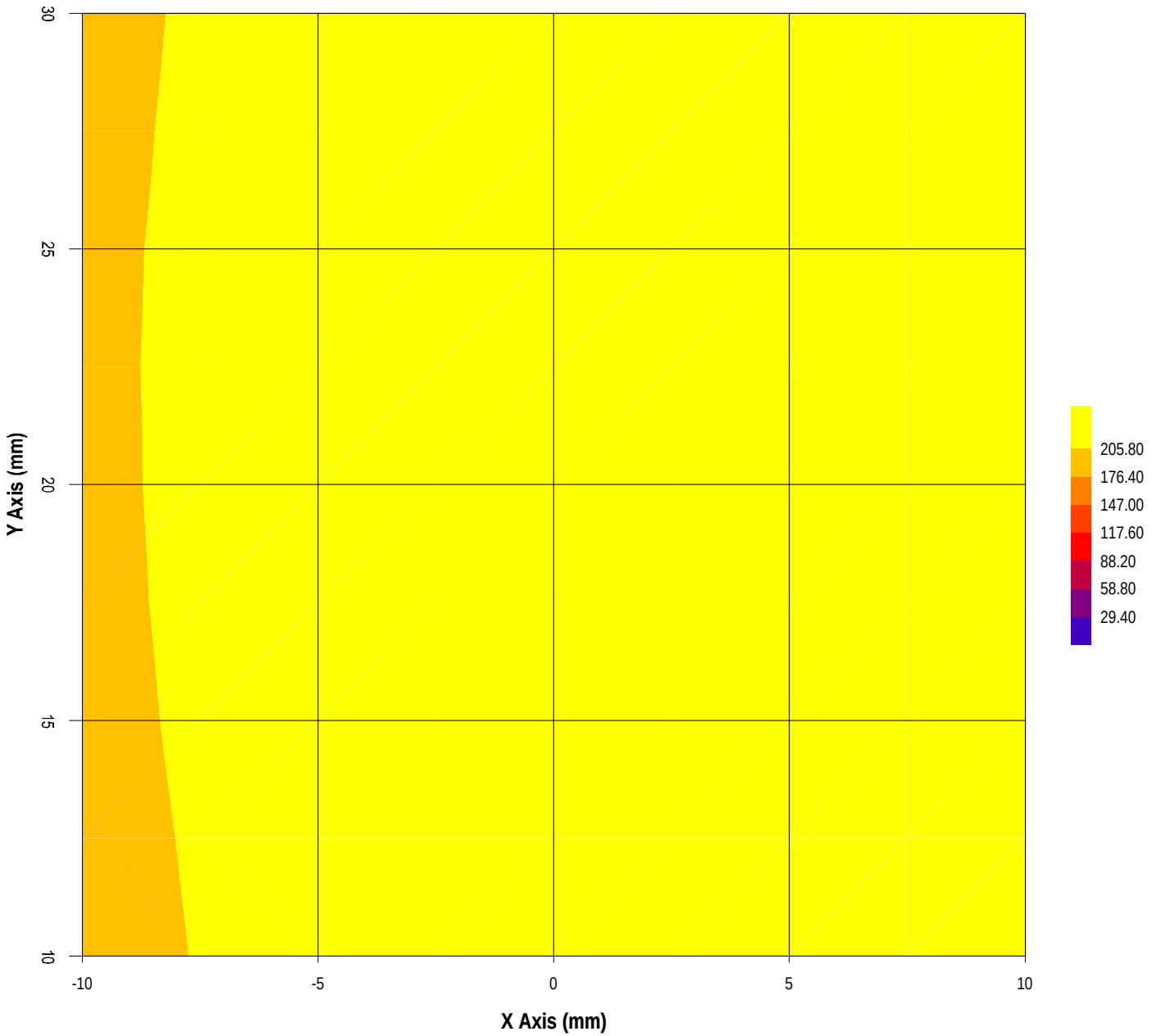
Peak Voltage (mV) : 264.272 **1 Cm Voltage (mV)** : 140.441 **SAR (W/Kg)** : 11.507

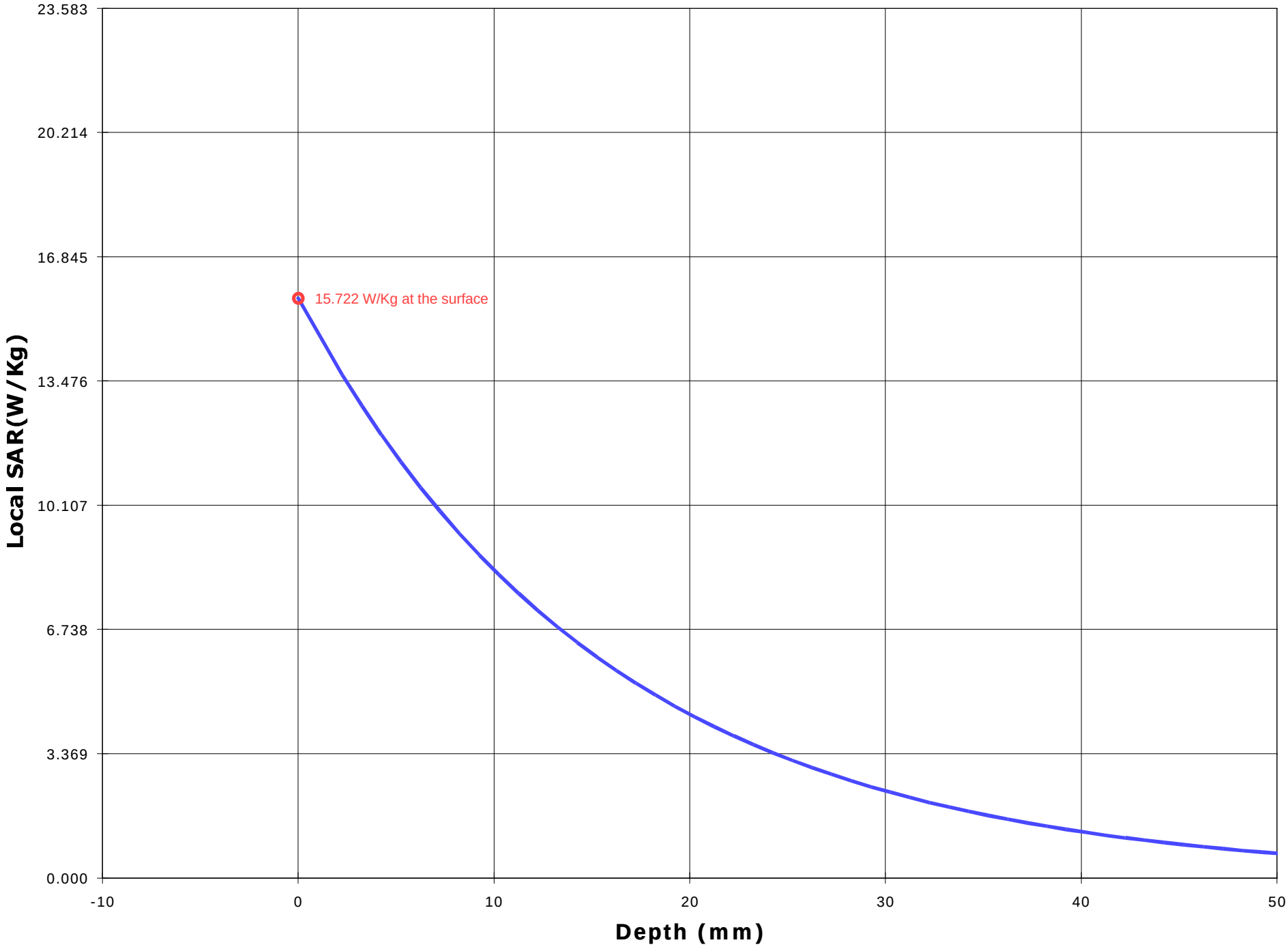

250.00
200.00
150.00
100.00
50.00
250.00
200.00
150.00
100.00
50.00
-10
0
10
20
30
40
50
60
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60

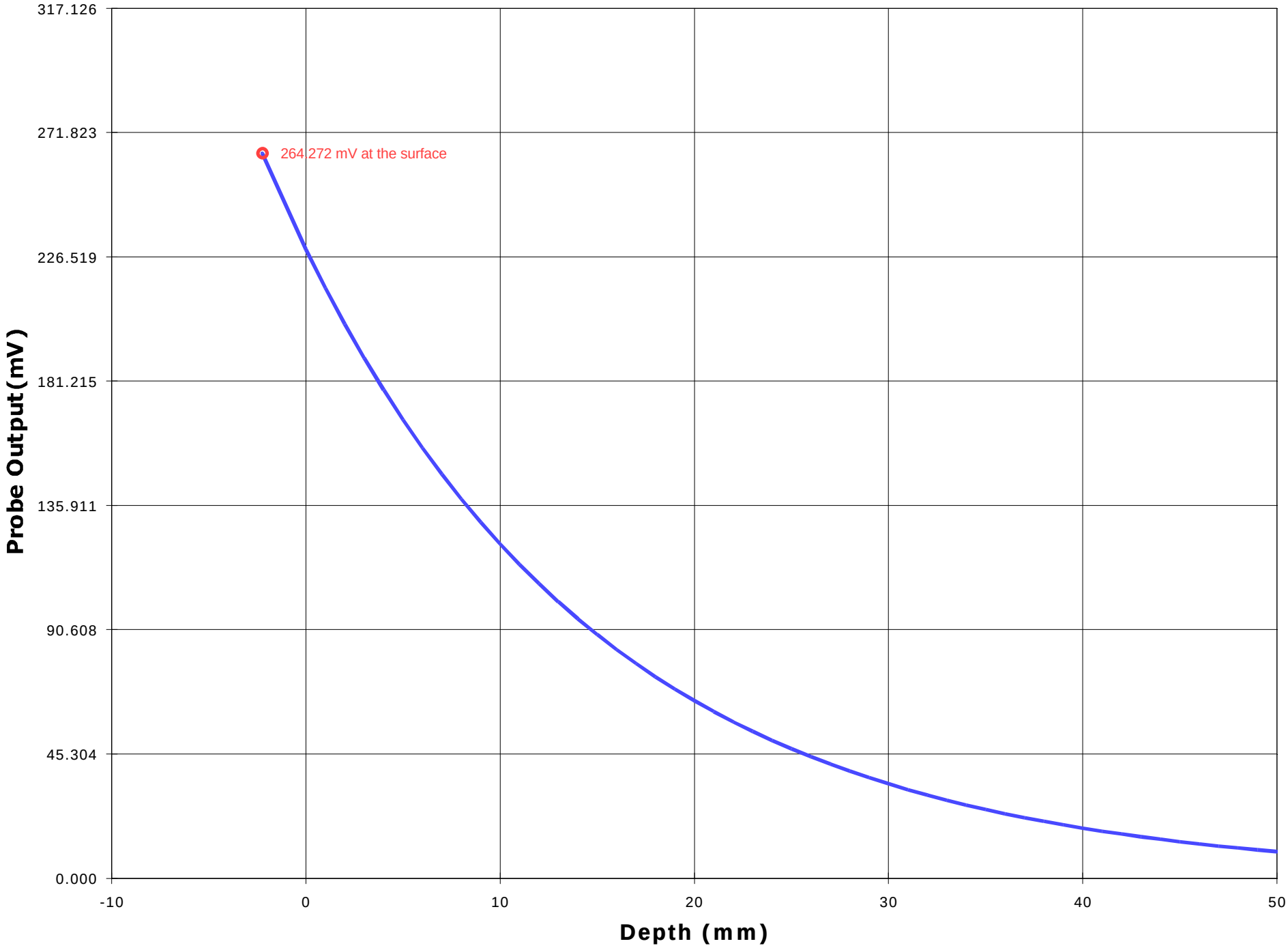

205.80
176.40
147.00
117.60
88.20
58.80
29.40


250.00
200.00
150.00
100.00
50.00
0.00
250.00
200.00
150.00
100.00
50.00
0.00
-10
-5
0
5
10
0
5
10
15
20
25
205.80
176.40
147.00
117.60
88.20
58.80
29.40


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-20
-10
0
10
20
30
40
50
60
X Axis (mm)
205.80
176.40
147.00
117.60
88.20
58.80
29.40


Y Axis (mm)
30
25
20
15
10
-10
-5
0
5
10
X Axis (mm)
205.80
176.40
147.00
117.60
88.20
58.80
29.40


23.583
20.214
16.845
13.476
10.107
6.738
3.369
0.000
Local SAR(W/Kg)
15.722 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


317.126
271.823
226.519
181.215
135.911
90.608
45.304
0.000
Probe Output (mV)
264.272 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 30/11/2001
Time : 11:59:25 AM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 415.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Waist	**Dielectric Constant**	: 56.84
Simulated Tissue	: Muscle	**Conductivity**	: 0.92

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.96
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.642	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.960

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

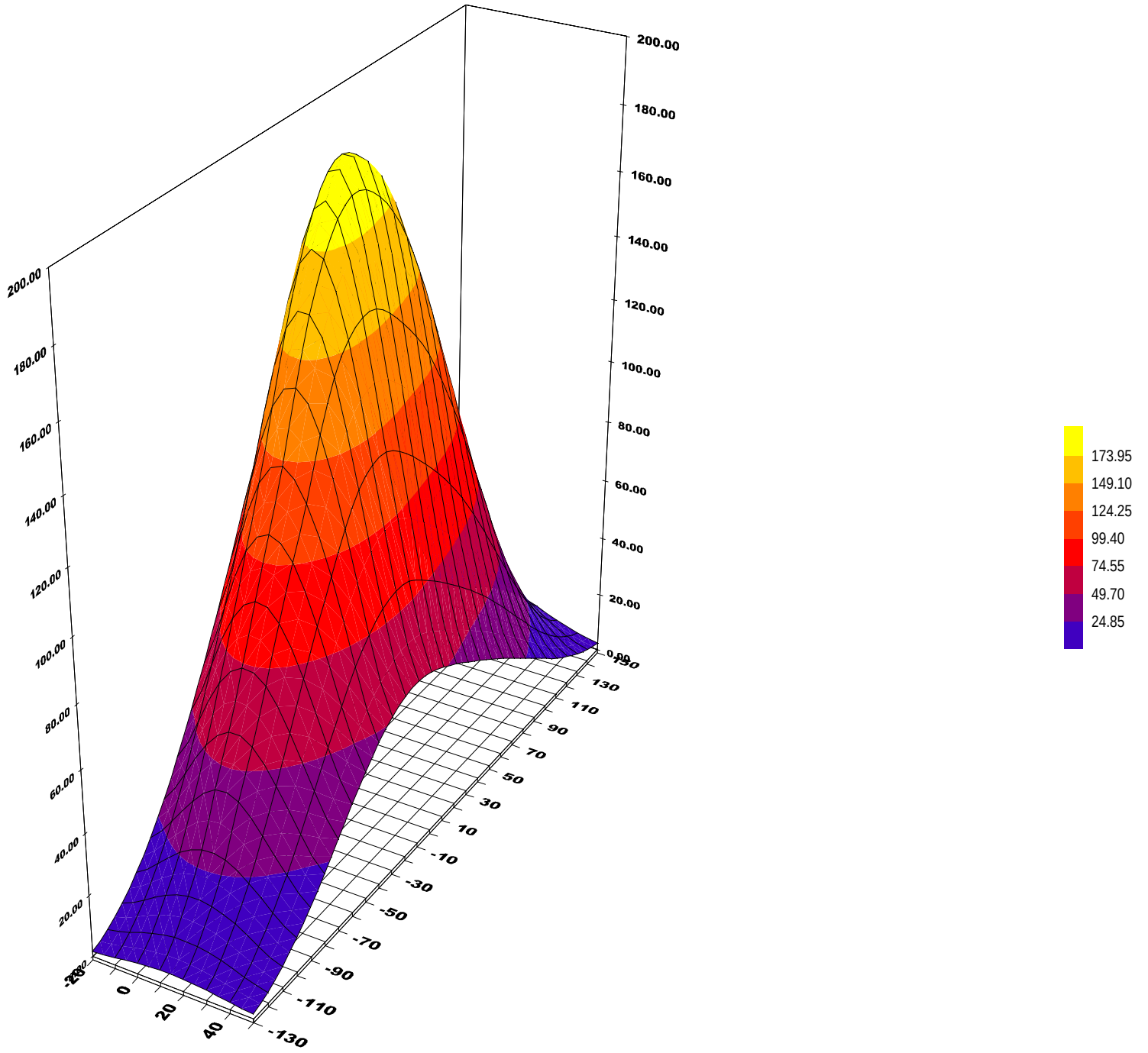
Location of Maximum Field :

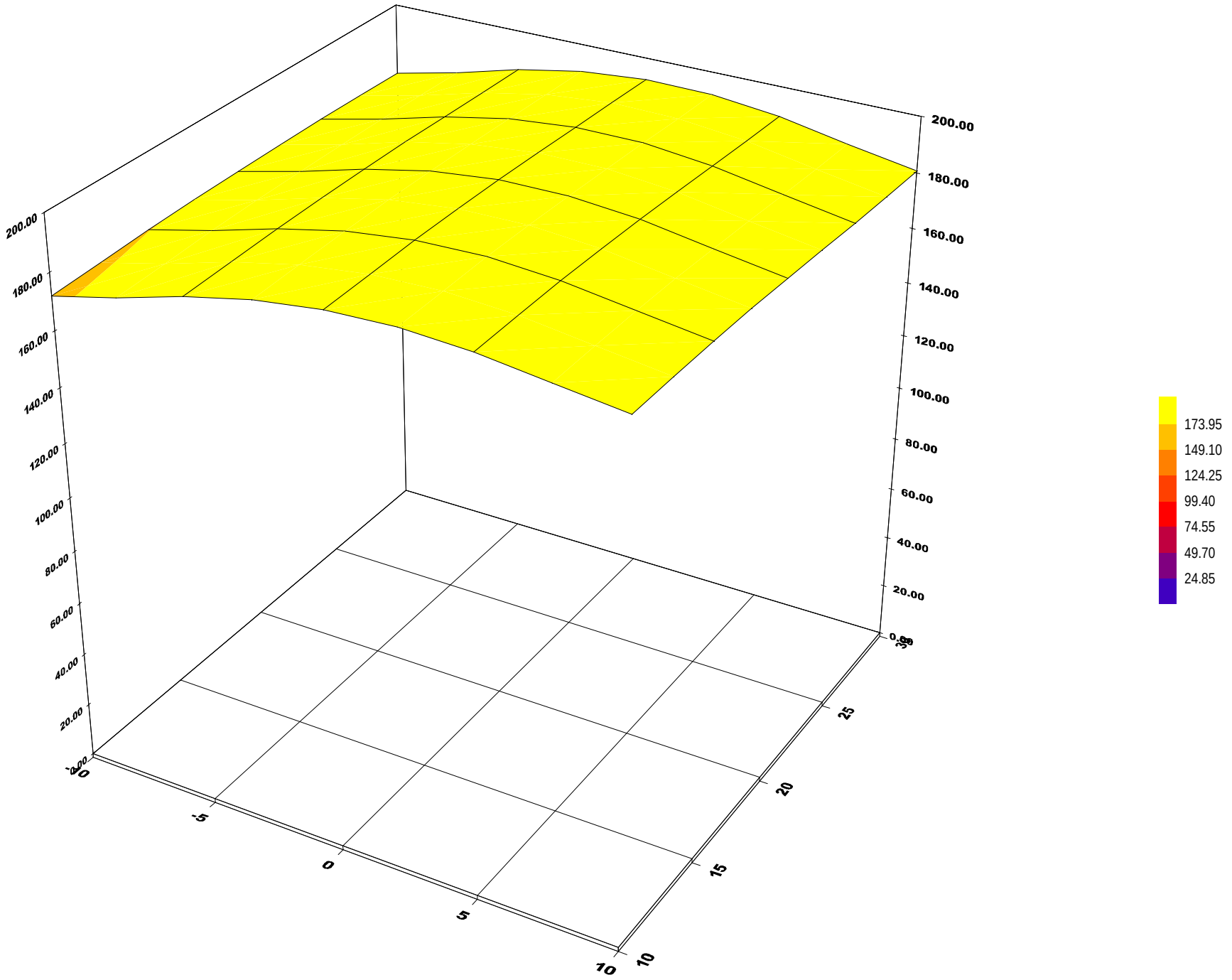
X = 0 Y = 15

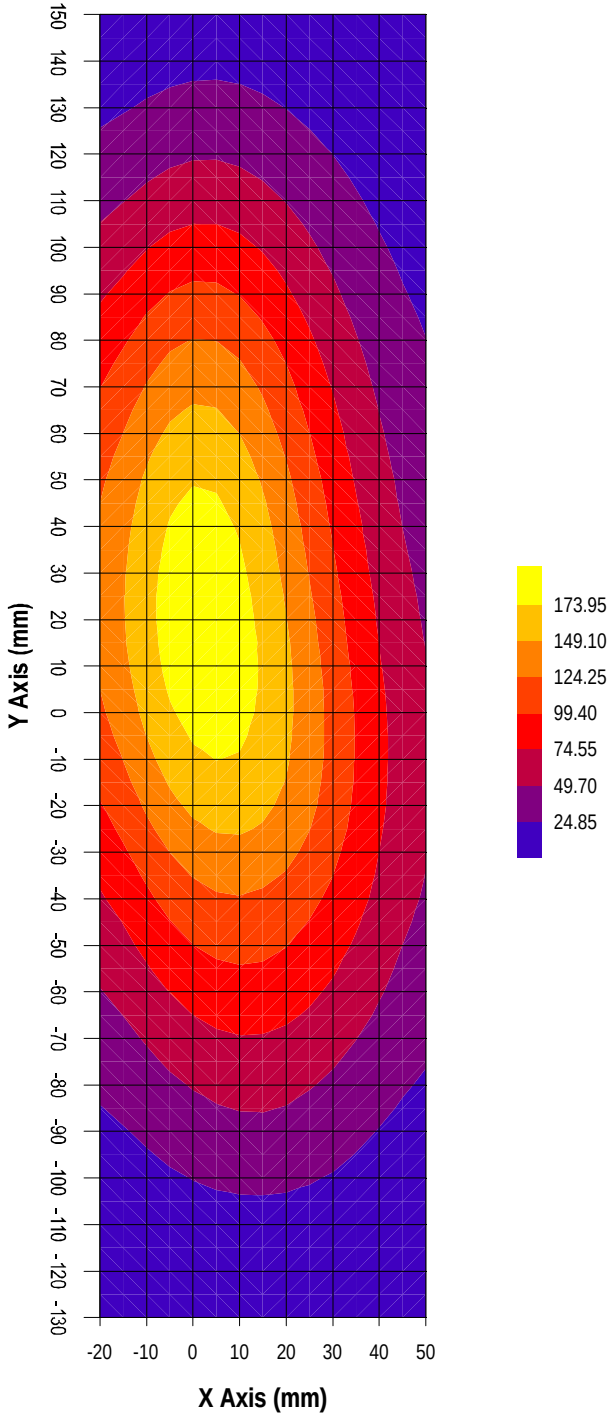
Measured Values (mV) :

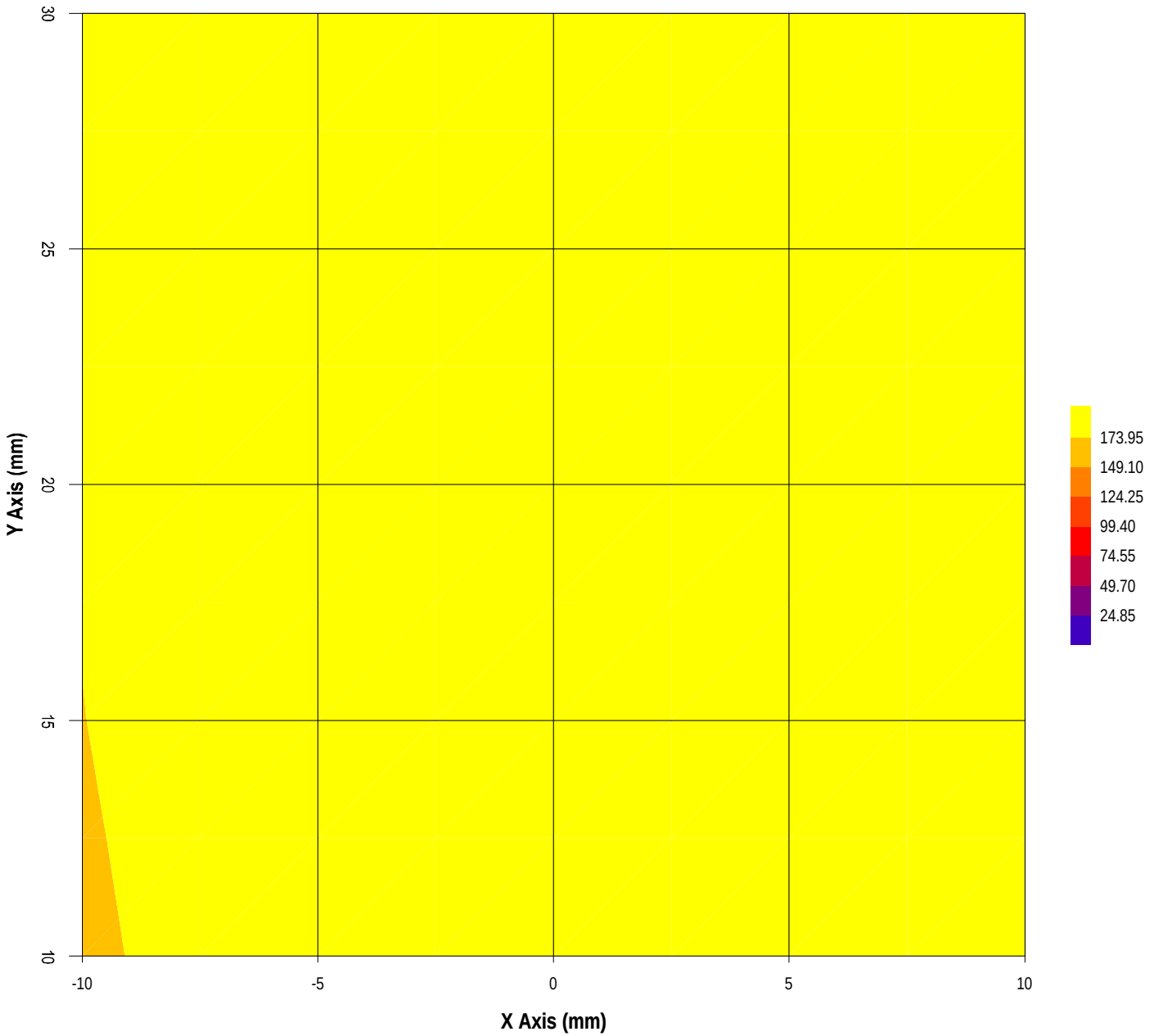
194.794	182.093	161.872	151.181	140.298	132.505
125.464	118.808	111.658	105.290	99.238	

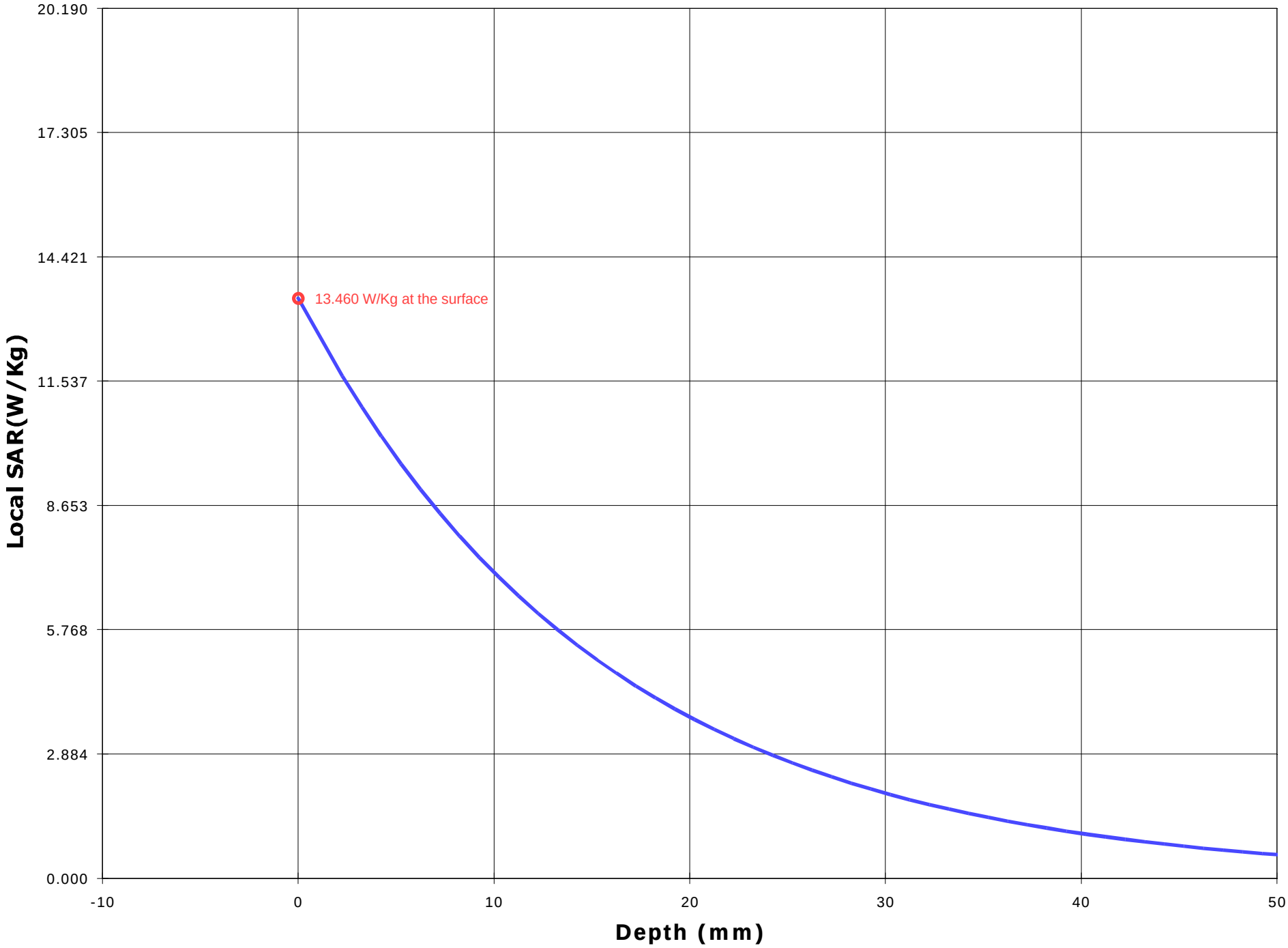
Peak Voltage (mV) : 226.250 **1 Cm Voltage (mV)** : 119.334 **SAR (W/Kg)** : 9.816

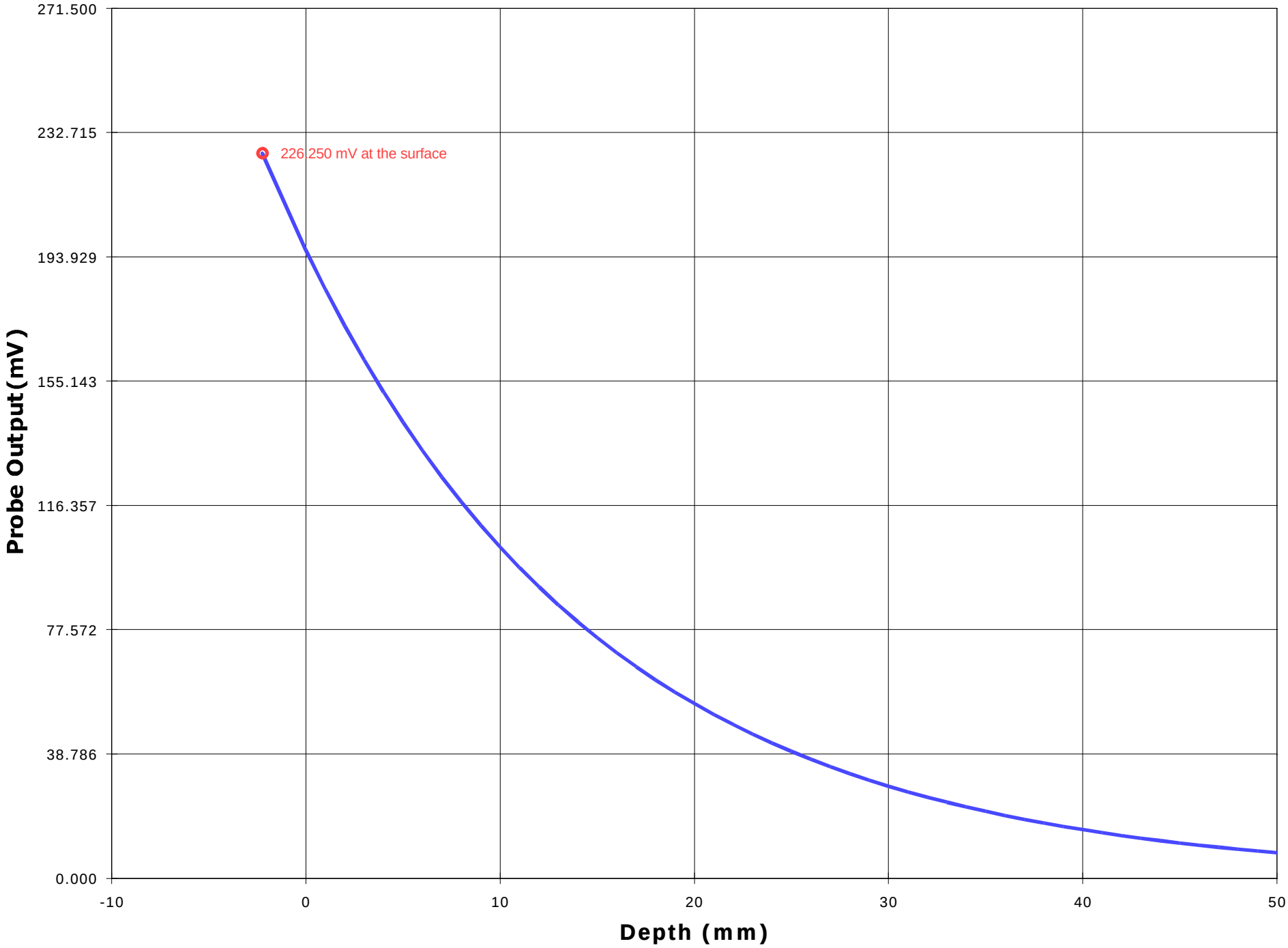

200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
130
110
90
70
50
30
10
-10
-30
-50
-70
-90
-110
-130
0
20
40
173.95
149.10
124.25
99.40
74.55
49.70
24.85


200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-5
0
5
10
15
20
25
173.95
149.10
124.25
99.40
74.55
49.70
24.85


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-20
-10
0
10
20
30
40
50
X Axis (mm)
173.95
149.10
124.25
99.40
74.55
49.70
24.85


30
25
20
15
10
Y Axis (mm)
-10
-5
0
5
10
X Axis (mm)
173.95
149.10
124.25
99.40
74.55
49.70
24.85


20.190
17.305
14.421
11.537
8.653
5.768
2.884
0.000
Local SAR(W/Kg)
13.460 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


271.500
232.715
193.929
155.143
116.357
77.572
38.786
0.000
Probe Output (mV)
226.250 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 30/11/2001
Time : 5:53:55 PM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 429.95
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Waist	**Dielectric Constant**	: 56.84
Simulated Tissue	: Muscle	**Conductivity**	: 0.92

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 4.08
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.642	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 4.080

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

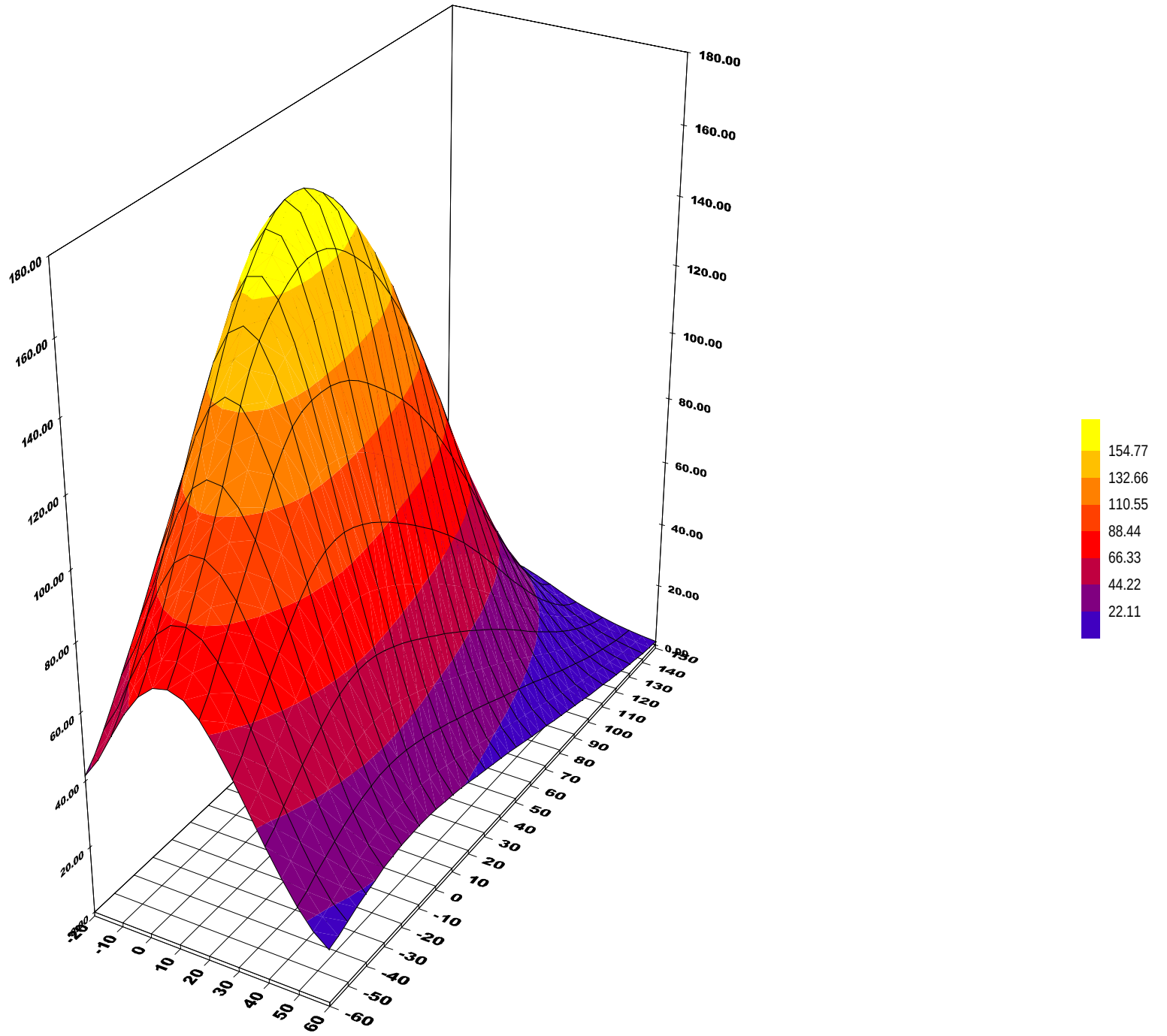
Location of Maximum Field :

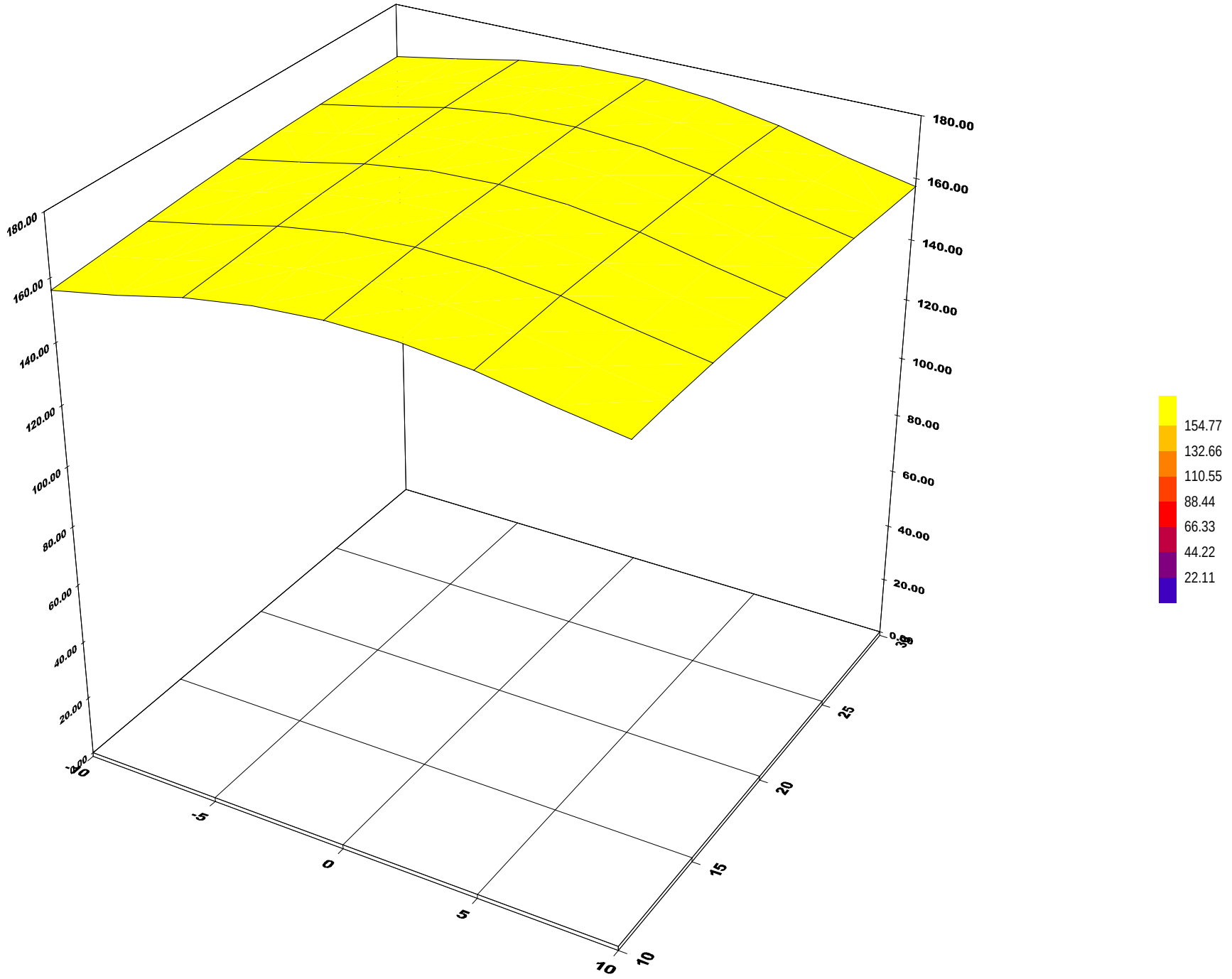
X = 0 Y = 25

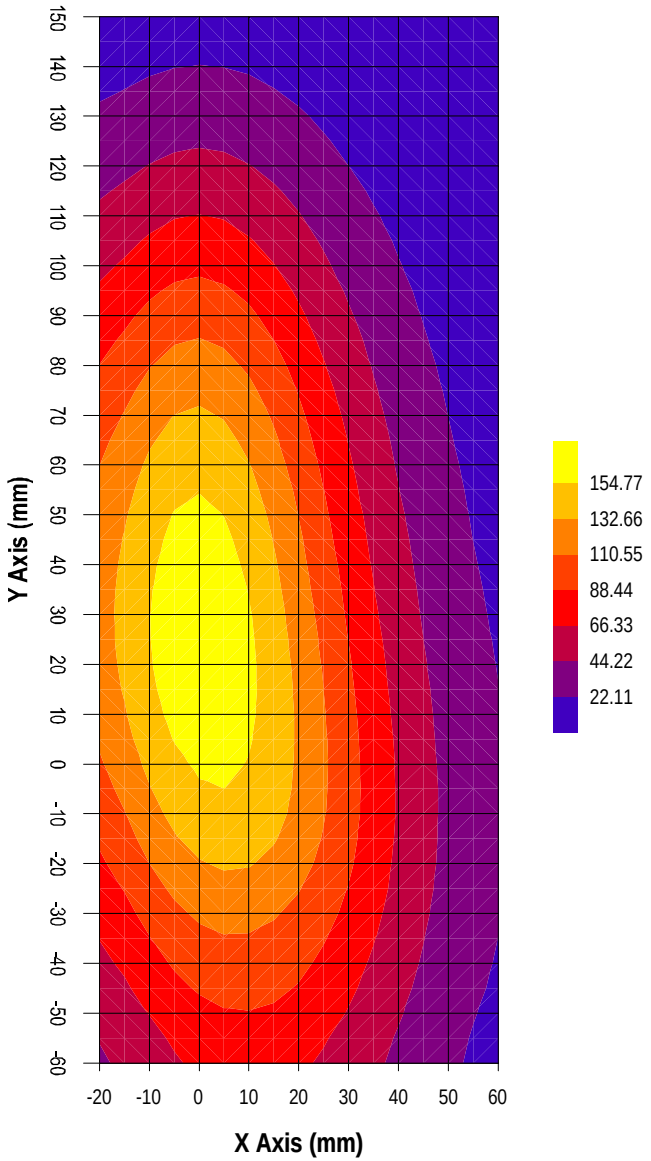
Measured Values (mV) :

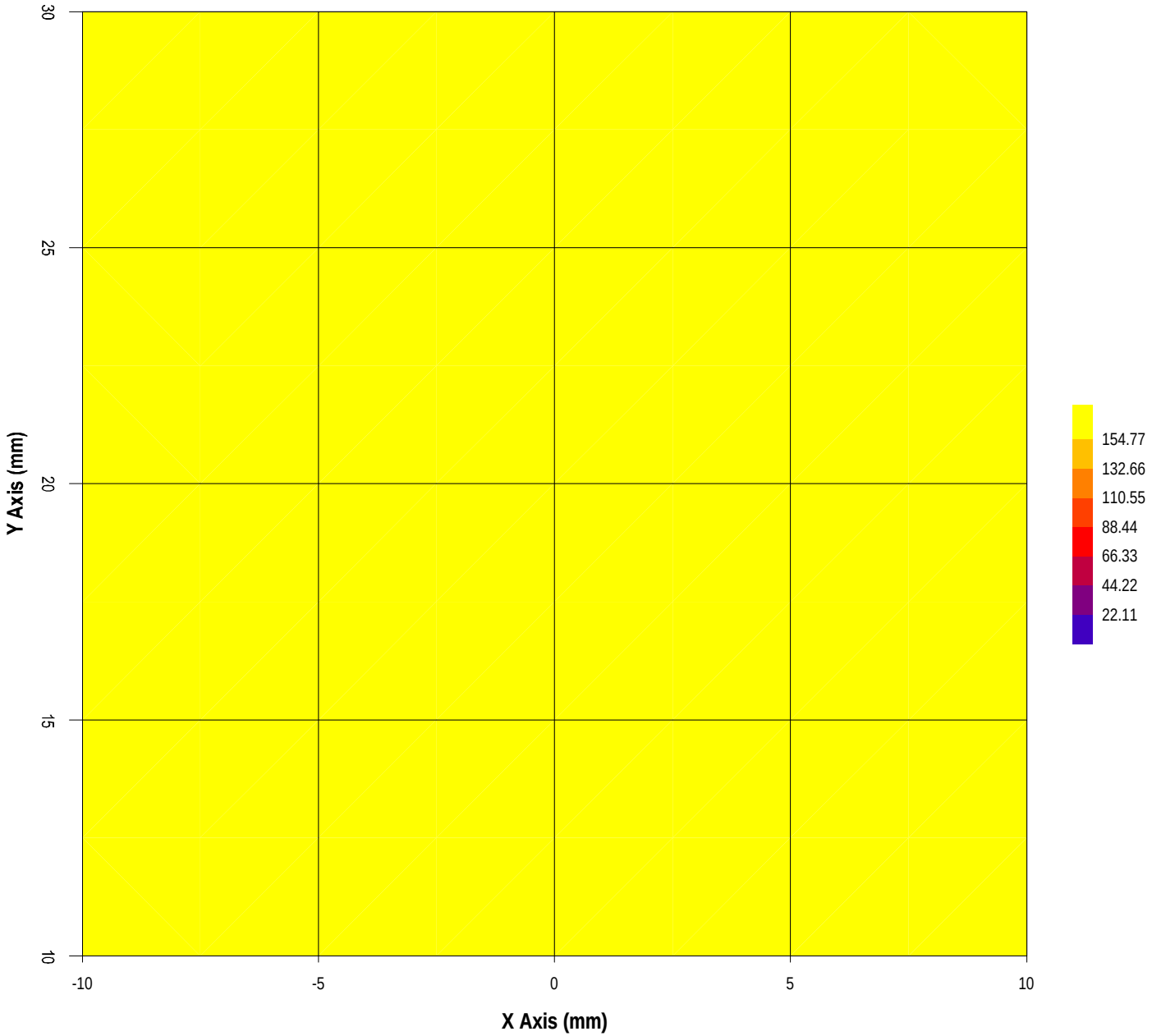
174.980	160.461	144.380	132.992	123.762	116.430
110.310	103.747	98.556	93.137	88.028	

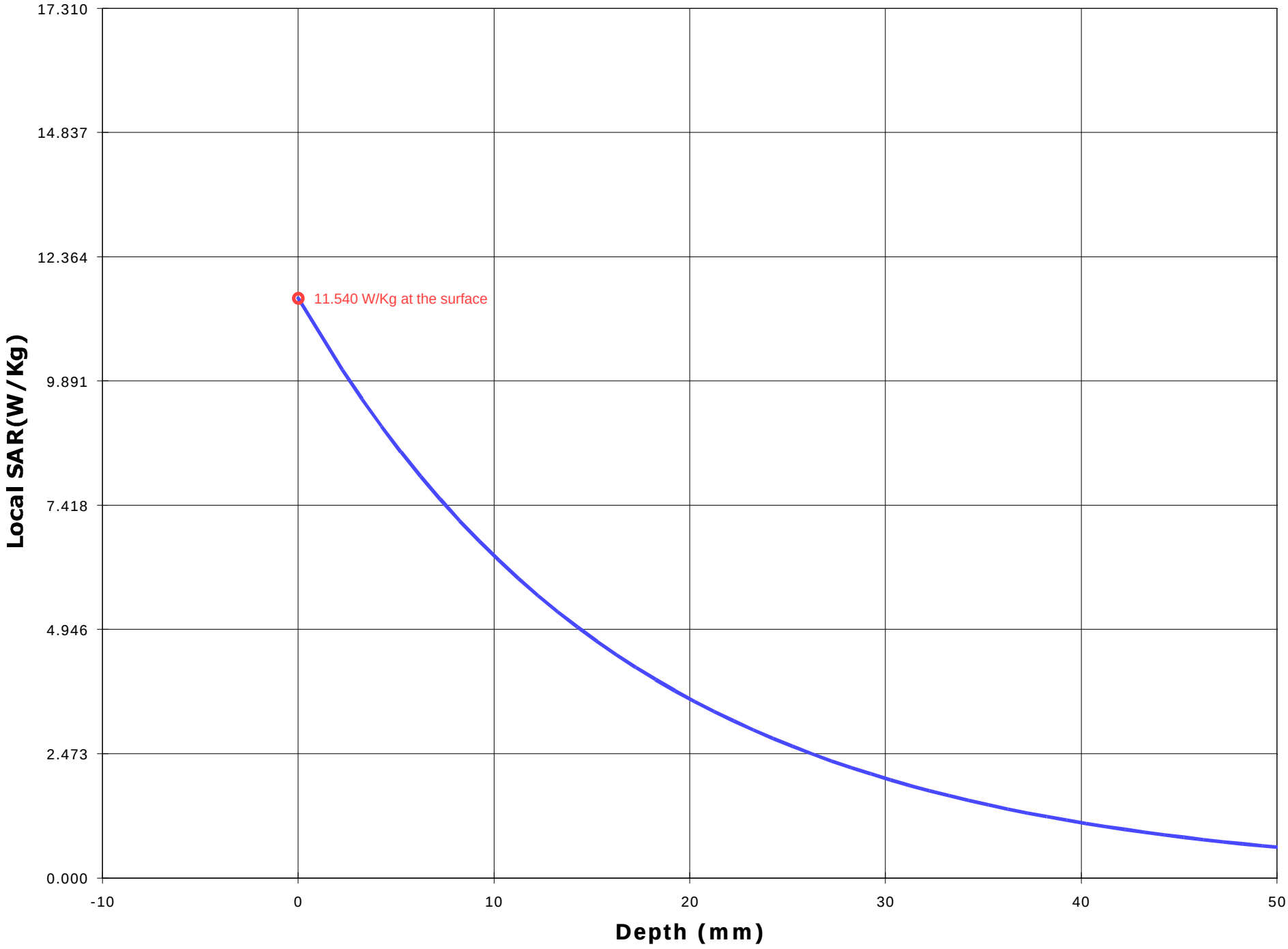
Peak Voltage (mV) : 193.976 **1 Cm Voltage (mV)** : 107.810 **SAR (W/Kg)** : 8.880

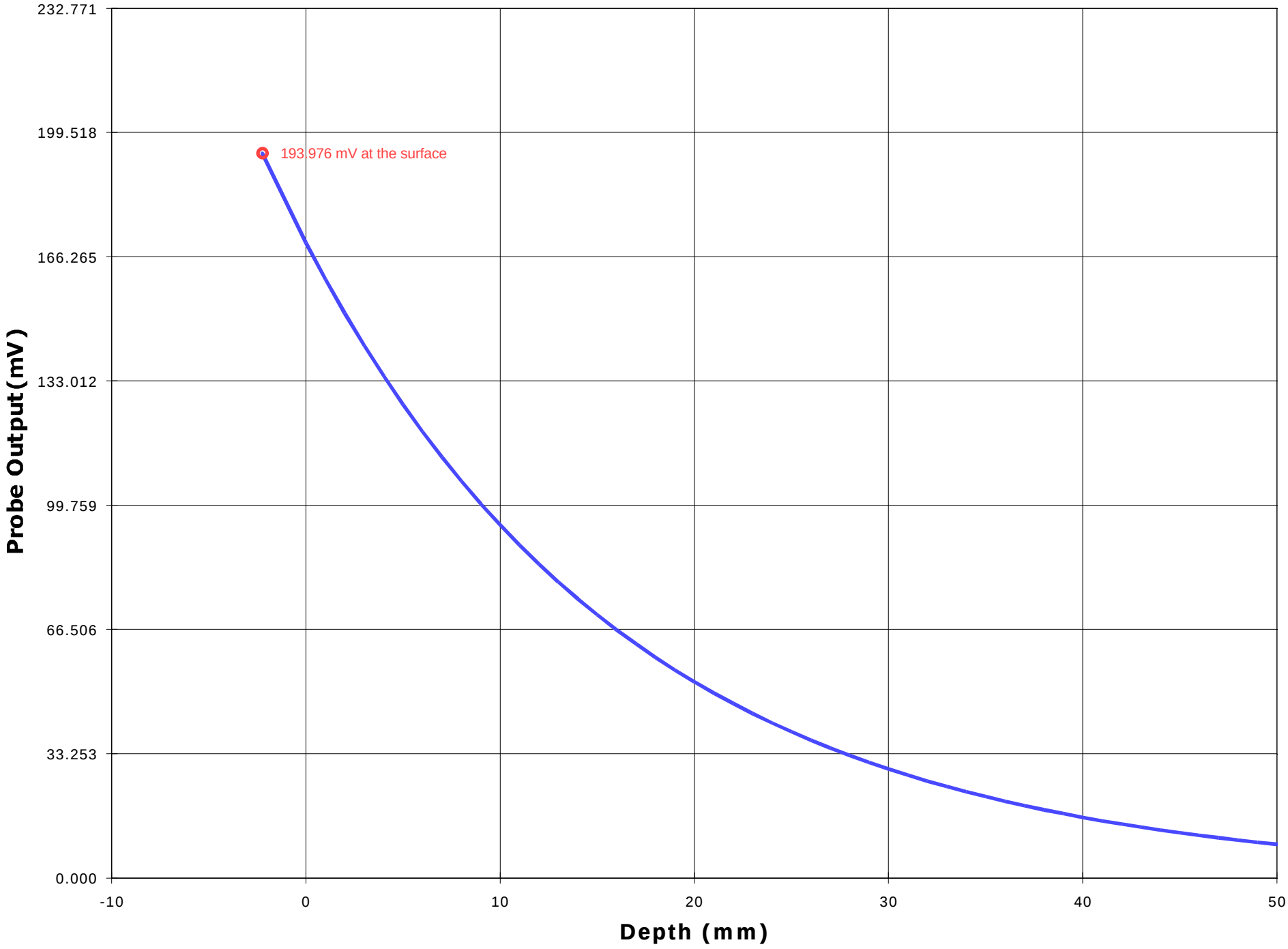

180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
-10
0
10
20
30
40
50
60
-20
-30
-40
-50
-60
70
80
90
100
110
120
130
140
150
154.77
132.66
110.55
88.44
66.33
44.22
22.11


180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-10
-5
0
5
10
15
20
25
154.77
132.66
110.55
88.44
66.33
44.22
22.11


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-20
-10
0
10
20
30
40
50
60
X Axis (mm)
154.77
132.66
110.55
88.44
66.33
44.22
22.11


30
25
20
15
10
Y Axis (mm)
-10
-5
0
5
10
X Axis (mm)
154.77
132.66
110.55
88.44
66.33
44.22
22.11


17.310
14.837
12.364
9.891
7.418
4.946
2.473
0.000
Local SAR(W/Kg)
11.540 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


232.771
199.518
166.265
133.012
99.759
66.506
33.253
0.000
Probe Output (mV)
193.976 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 30/11/2001
Time : 6:13:12 PM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 400.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Waist	**Dielectric Constant**	: 56.84
Simulated Tissue	: Muscle	**Conductivity**	: 0.92

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.90
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.642	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.900

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

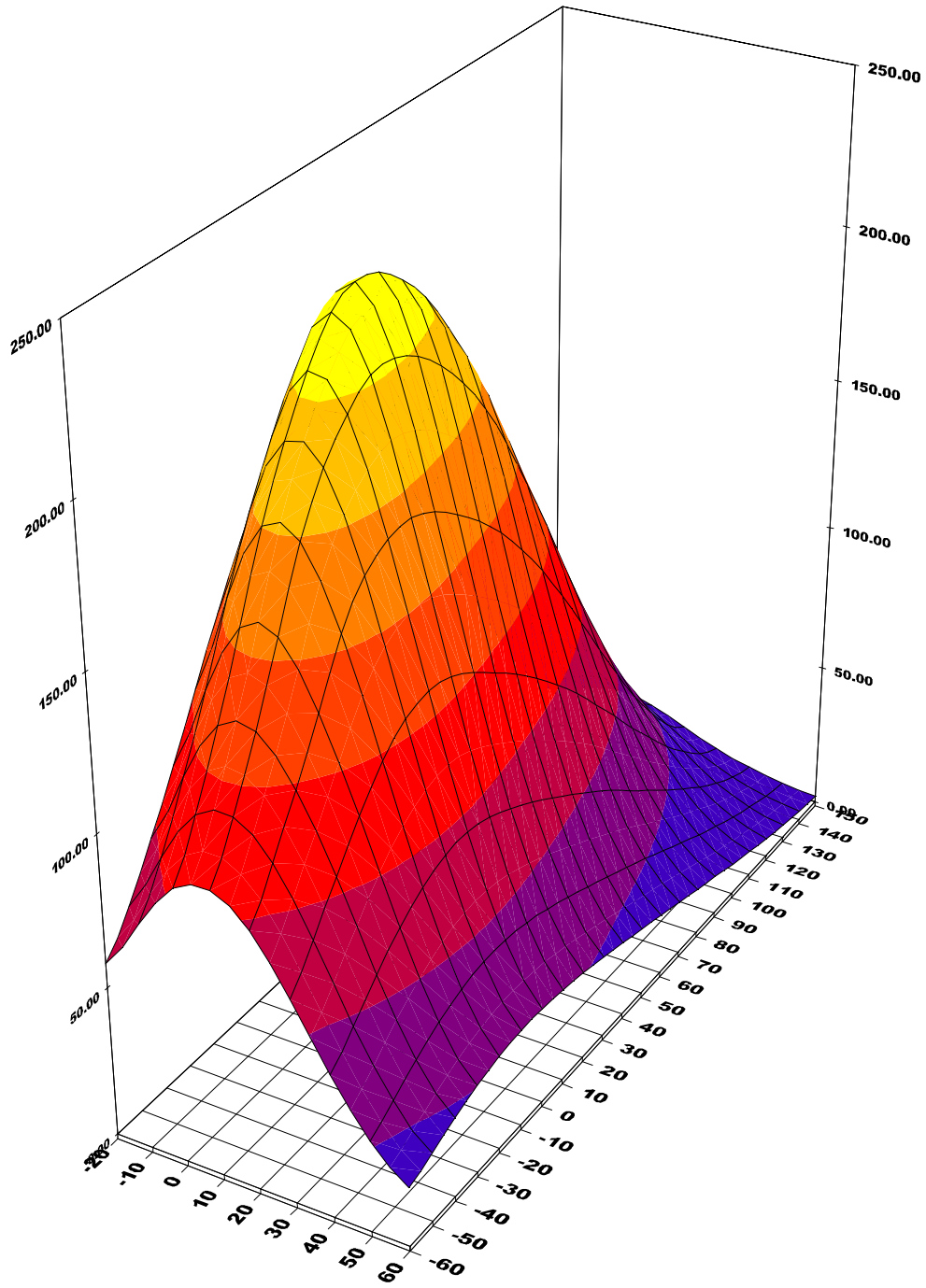
Location of Maximum Field :

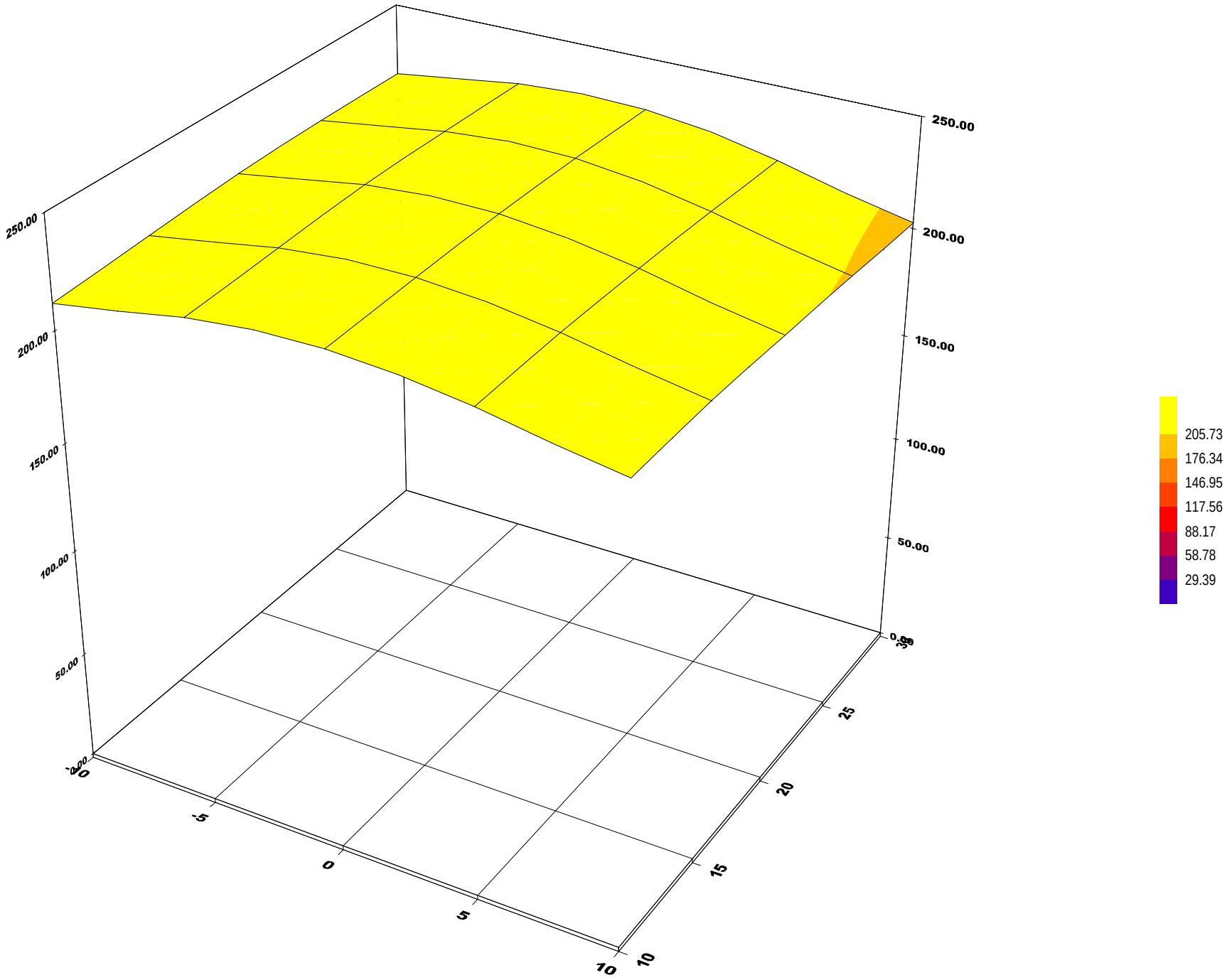
X = 0 Y = 25

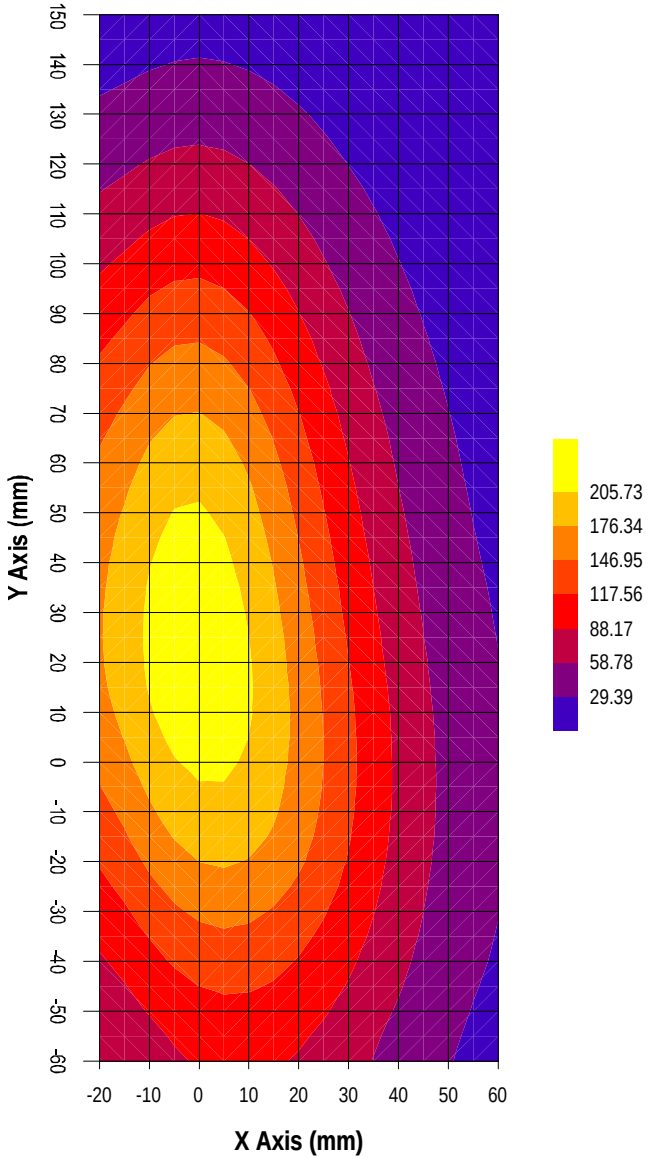
Measured Values (mV) :

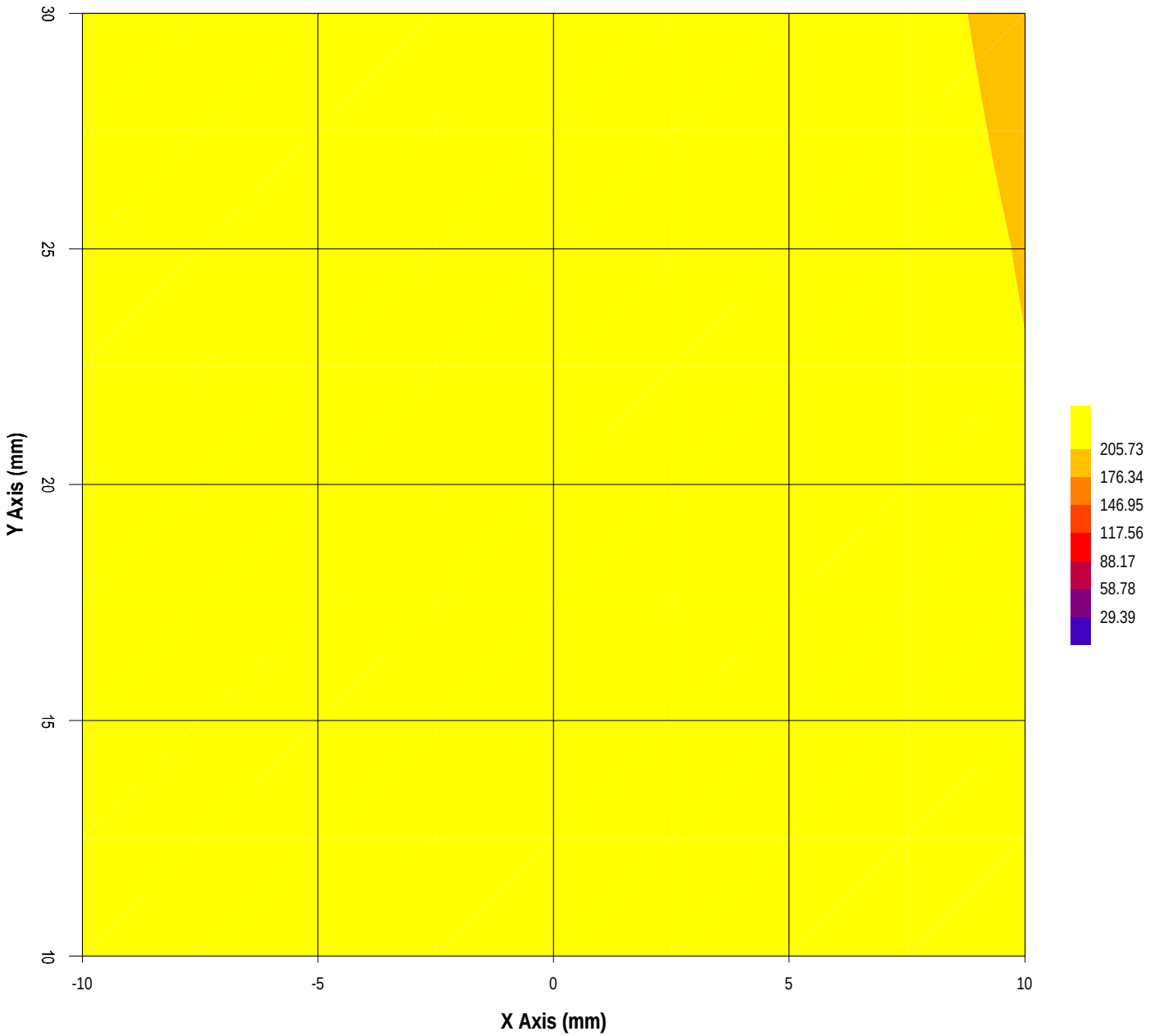
228.414	212.500	190.095	177.549	165.305	156.706
147.403	140.400	132.880	124.549	118.734	

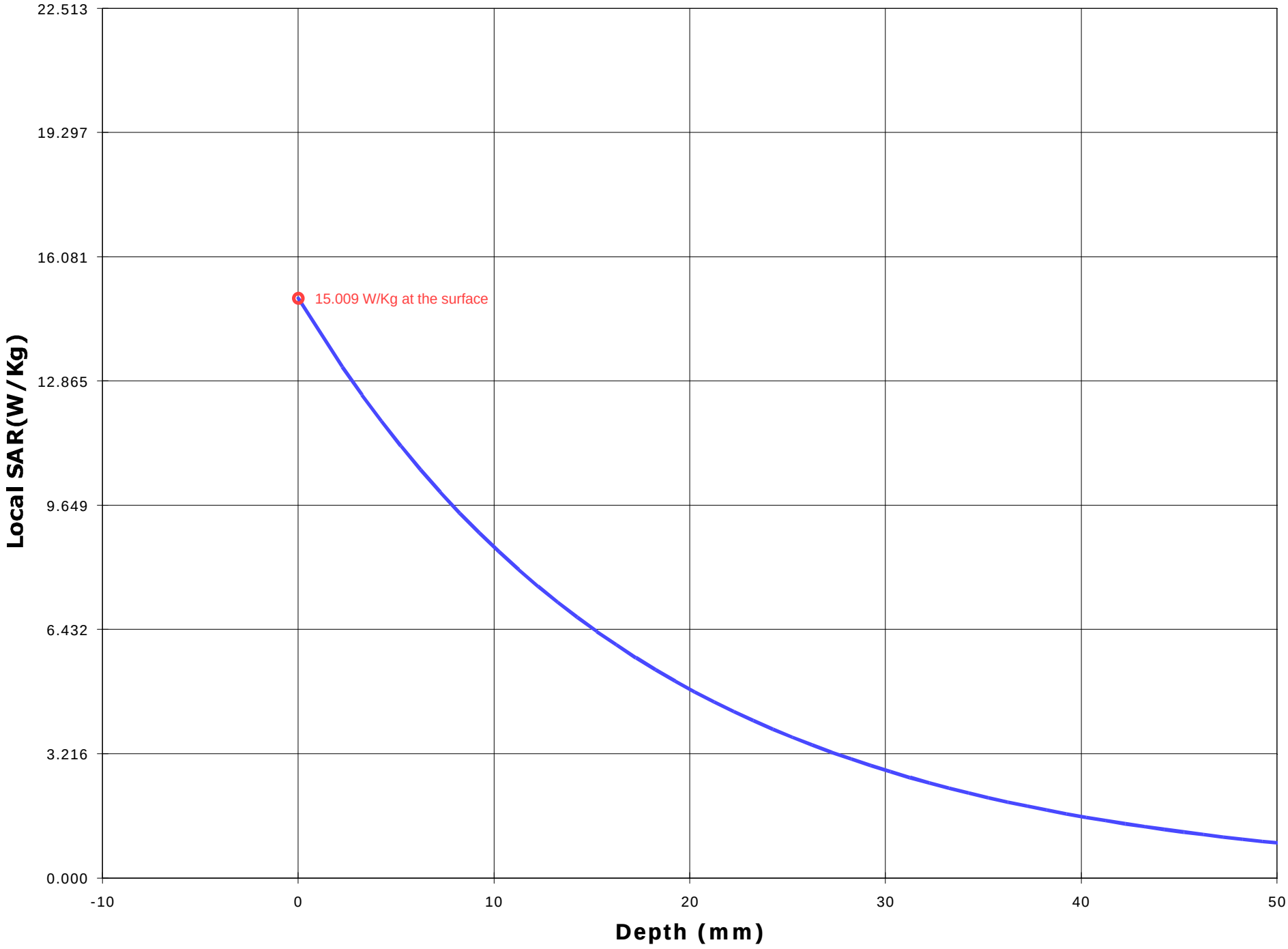
Peak Voltage (mV) : 252.289 **1 Cm Voltage (mV)** : 143.969 **SAR (W/Kg)** : 11.740

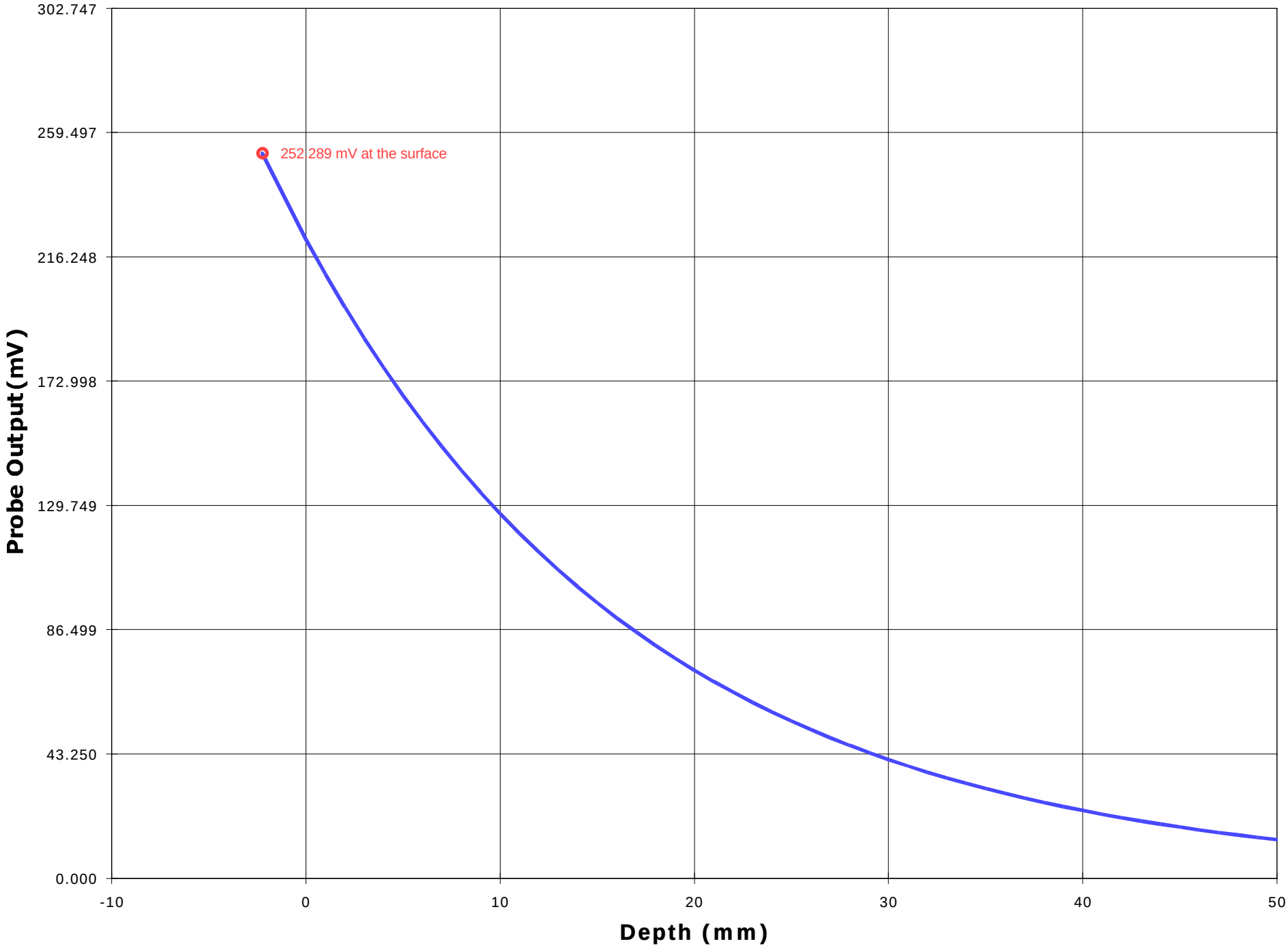

250.00
200.00
150.00
100.00
50.00
-10
0
10
20
30
40
50
60
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
205.73
176.34
146.95
117.56
88.17
58.78
29.39


250.00
200.00
150.00
100.00
50.00
-10.00
-5
0
5
10
15
20
25
205.73
176.34
146.95
117.56
88.17
58.78
29.39


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-20
-10
0
10
20
30
40
50
60
X Axis (mm)
205.73
176.34
146.95
117.56
88.17
58.78
29.39


Y Axis (mm)
30
25
20
15
10
-10
-5
0
5
10
X Axis (mm)
205.73
176.34
146.95
117.56
88.17
58.78
29.39


22.513
19.297
16.081
12.865
9.649
6.432
3.216
0.000
Local SAR(W/Kg)
15.009 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


302.747
259.497
216.248
172.998
129.749
86.499
43.250
0.000
Probe Output (mV)
252.289 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 03/12/2001
Time : 9:43:57 AM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 415.05
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Waist	**Dielectric Constant**	: 56.84
Simulated Tissue	: Muscle	**Conductivity**	: 0.92

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 3.97
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.642	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 3.970

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

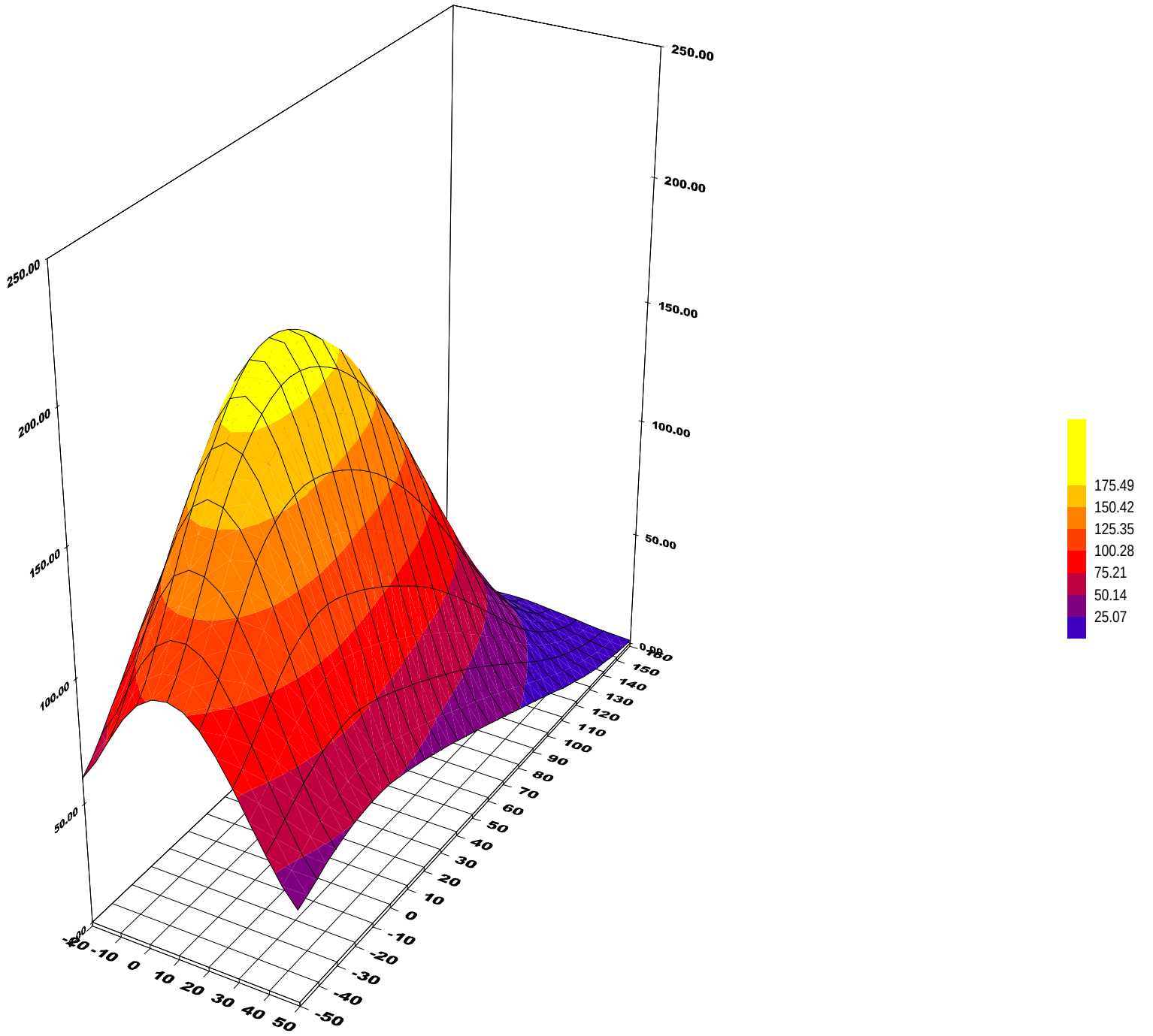
Location of Maximum Field :

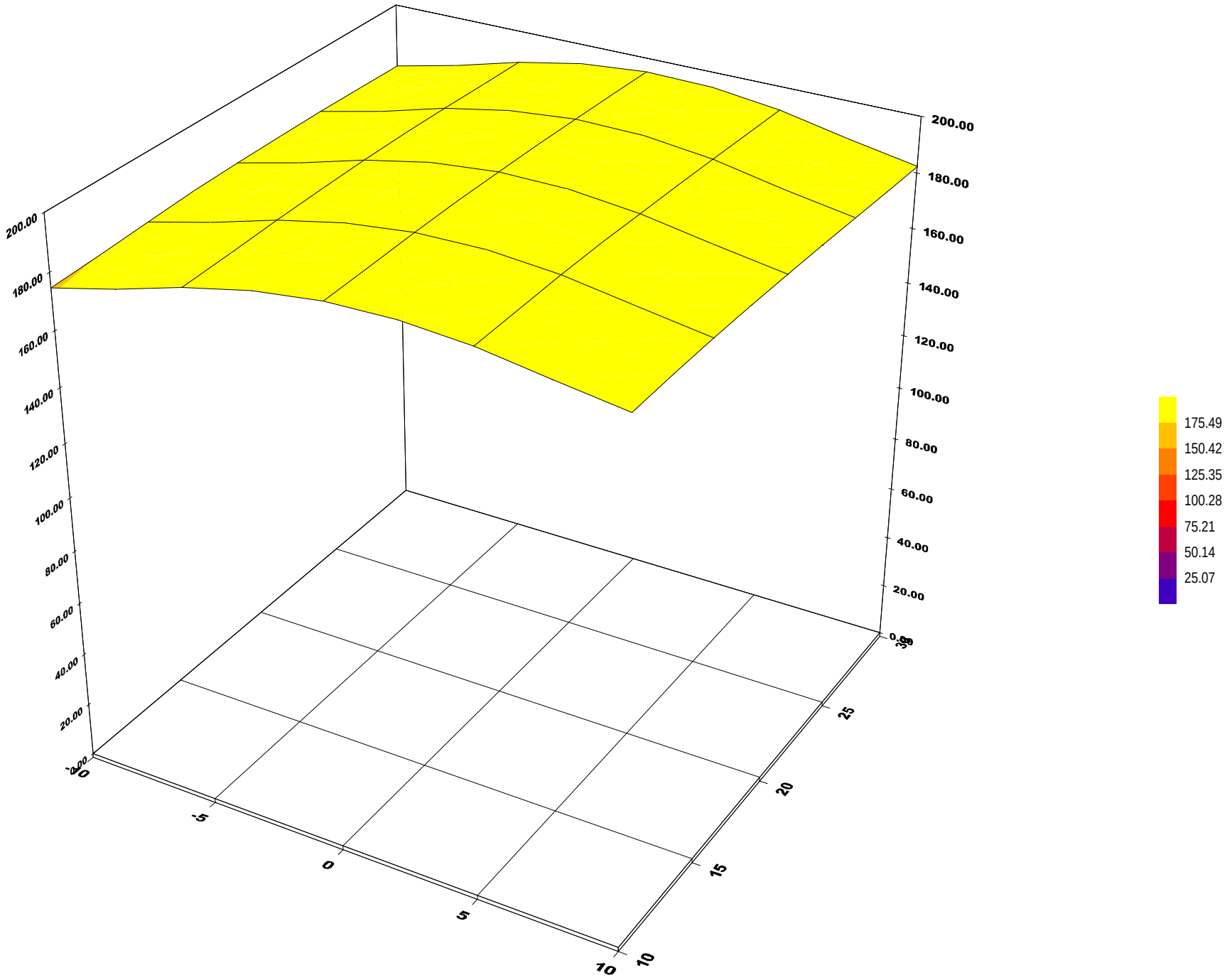
X = 0 Y = 20

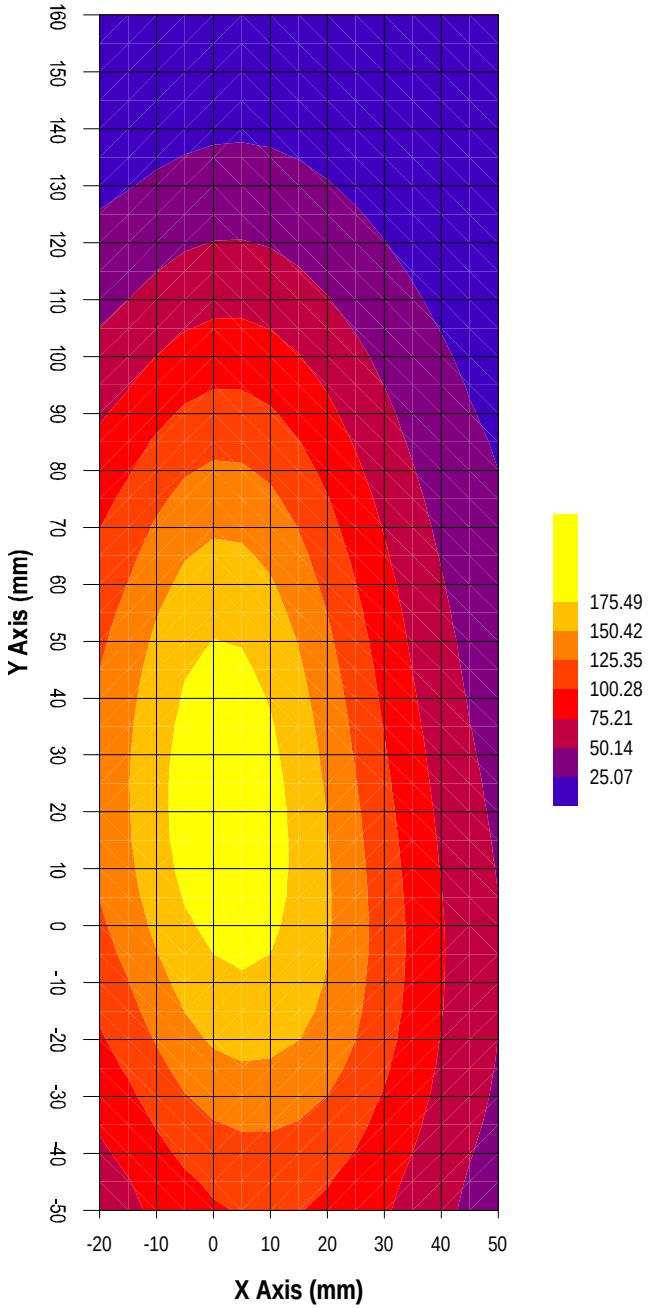
Measured Values (mV) :

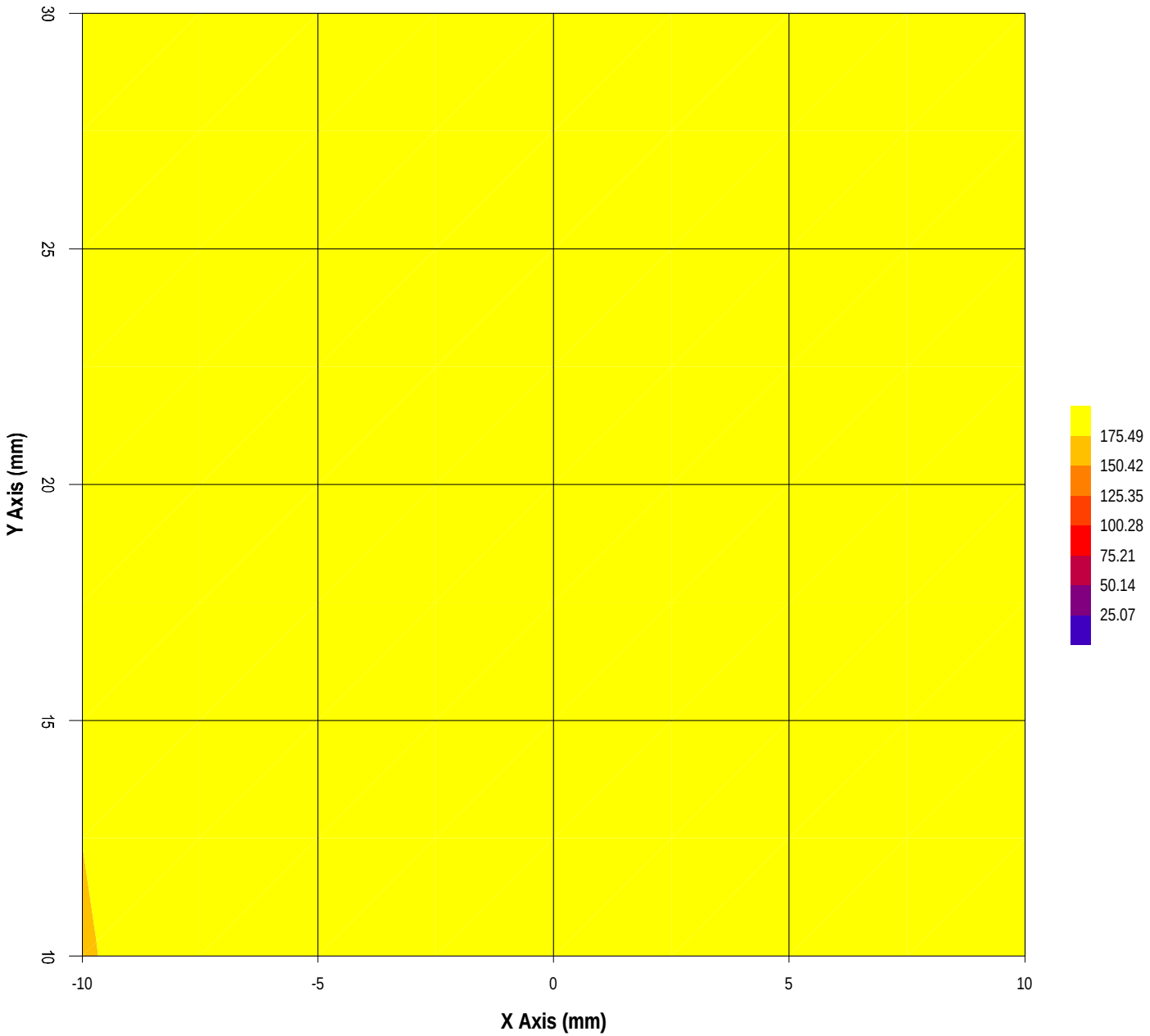
199.178	184.885	165.132	152.714	141.031	133.227
125.605	118.230	112.268	106.024	100.517	

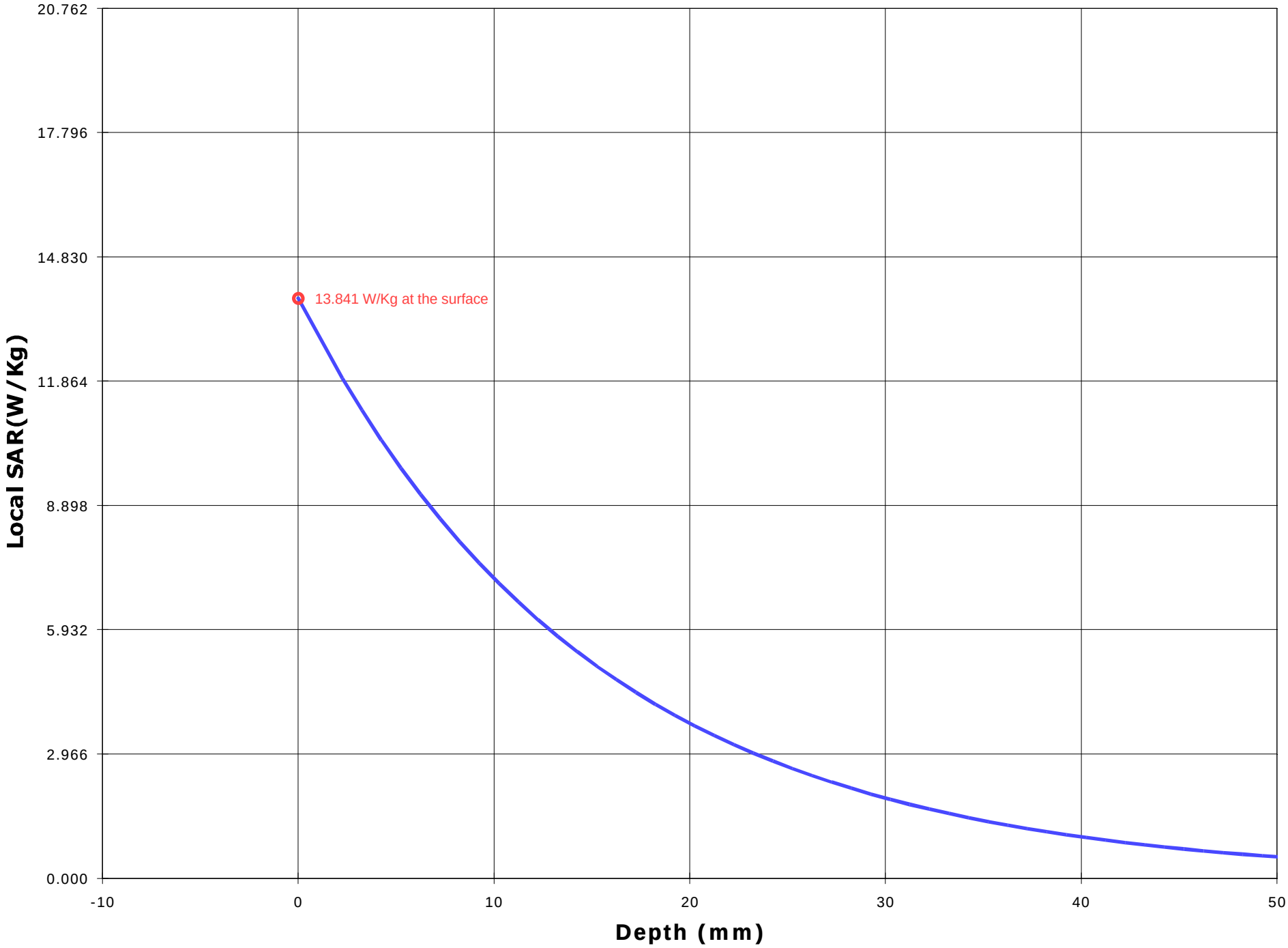
Peak Voltage (mV) : 232.658 **1 Cm Voltage (mV)** : 120.300 **SAR (W/Kg)** : 9.907

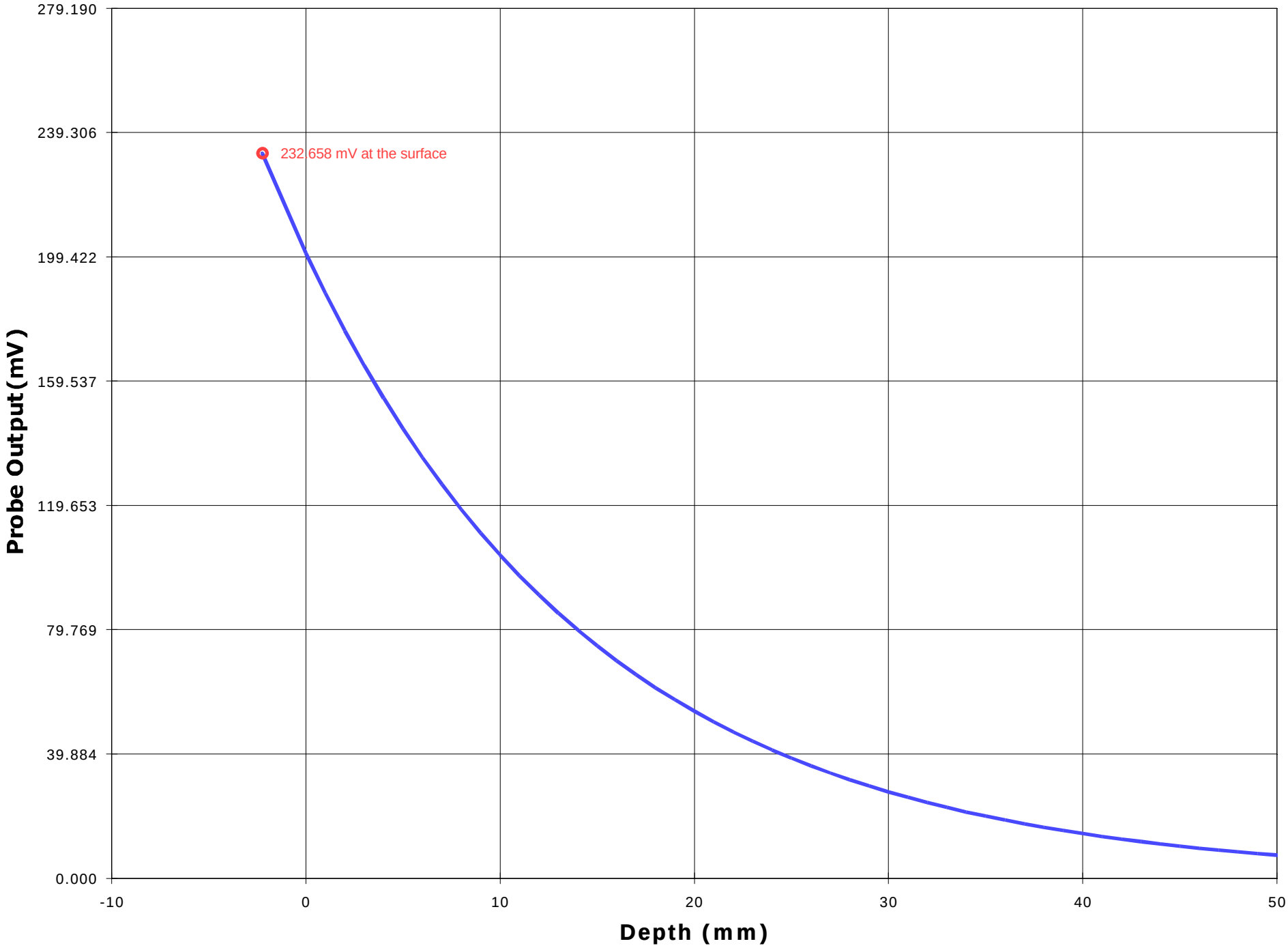

250.00
200.00
150.00
100.00
50.00
175.49
150.42
125.35
100.28
75.21
50.14
25.07
-50 -40 -30 -20 -10 0 10 20 30 40 50
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160


200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-5
0
5
10
15
20
25
175.49
150.42
125.35
100.28
75.21
50.14
25.07


Y Axis (mm)
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-20
-10
0
10
20
30
40
50
X Axis (mm)
175.49
150.42
125.35
100.28
75.21
50.14
25.07


30
25
20
15
10
Y Axis (mm)
-10
-5
0
5
10
X Axis (mm)
175.49
150.42
125.35
100.28
75.21
50.14
25.07


20.762
17.796
14.830
11.864
8.898
5.932
2.966
0.000
Local SAR(W/Kg)
13.841 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)


279.190
239.306
199.422
159.537
119.653
79.769
39.884
0.000
Probe Output (mV)
232.658 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

Test Information

Date : 03/12/2001
Time : 10:16:45 AM

Product	: UHF-FM Hand Held Transceiver	**Test**	: SAR
Manufacturer	: ICOM Inc.	**Frequency (MHz)**	: 429.95
Model Number	: IC-F21-1	**Nominal Output Power (W)**	: 4
Serial Number	: N/A	**Antenna Type**	: Monopole
FCC ID Number	: AFJIC-F21-1	**Signal**	: CW

Phantom	: Waist	**Dielectric Constant**	: 56.84
Simulated Tissue	: Muscle	**Conductivity**	: 0.92

Probe	: UT-ETR-0200-1	**Antenna Position**	: Fixed
Probe Offset (mm)	: 2.250	**Measured Power (W) (conducted)**	: 4.08
Sensor Factor (mV)	: 10.8		
Conversion Factor	: 0.642	**Cable Insertion Loss (dB)**	: 0
Calibrated Date	: 28/11/2001	**Compensated Power (W)**	: 4.080

Amplifier Setting :

Channel 1 : 0.0076 Channel 2 : 0.0069 Channel 3 : 0.0089

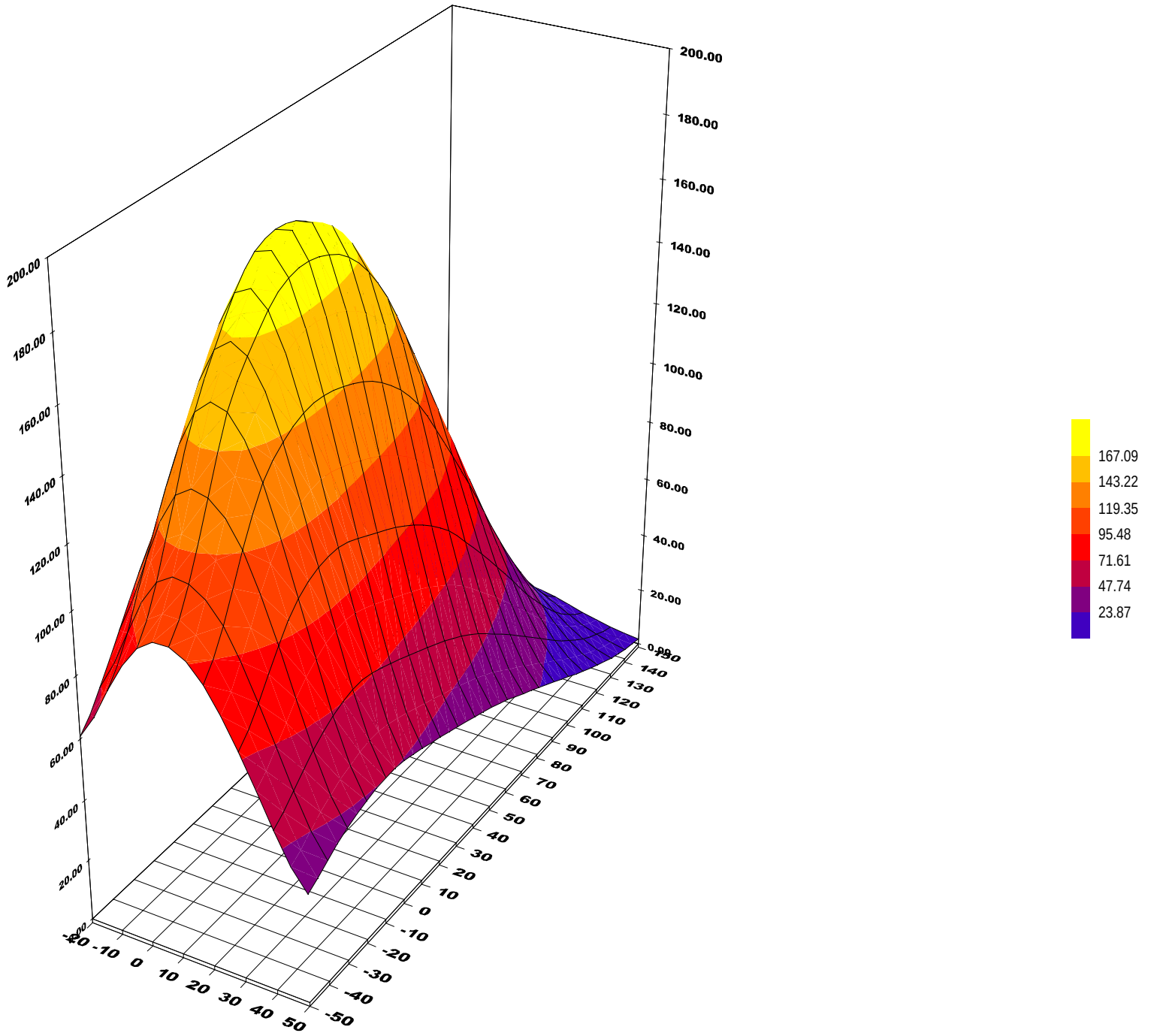
Location of Maximum Field :

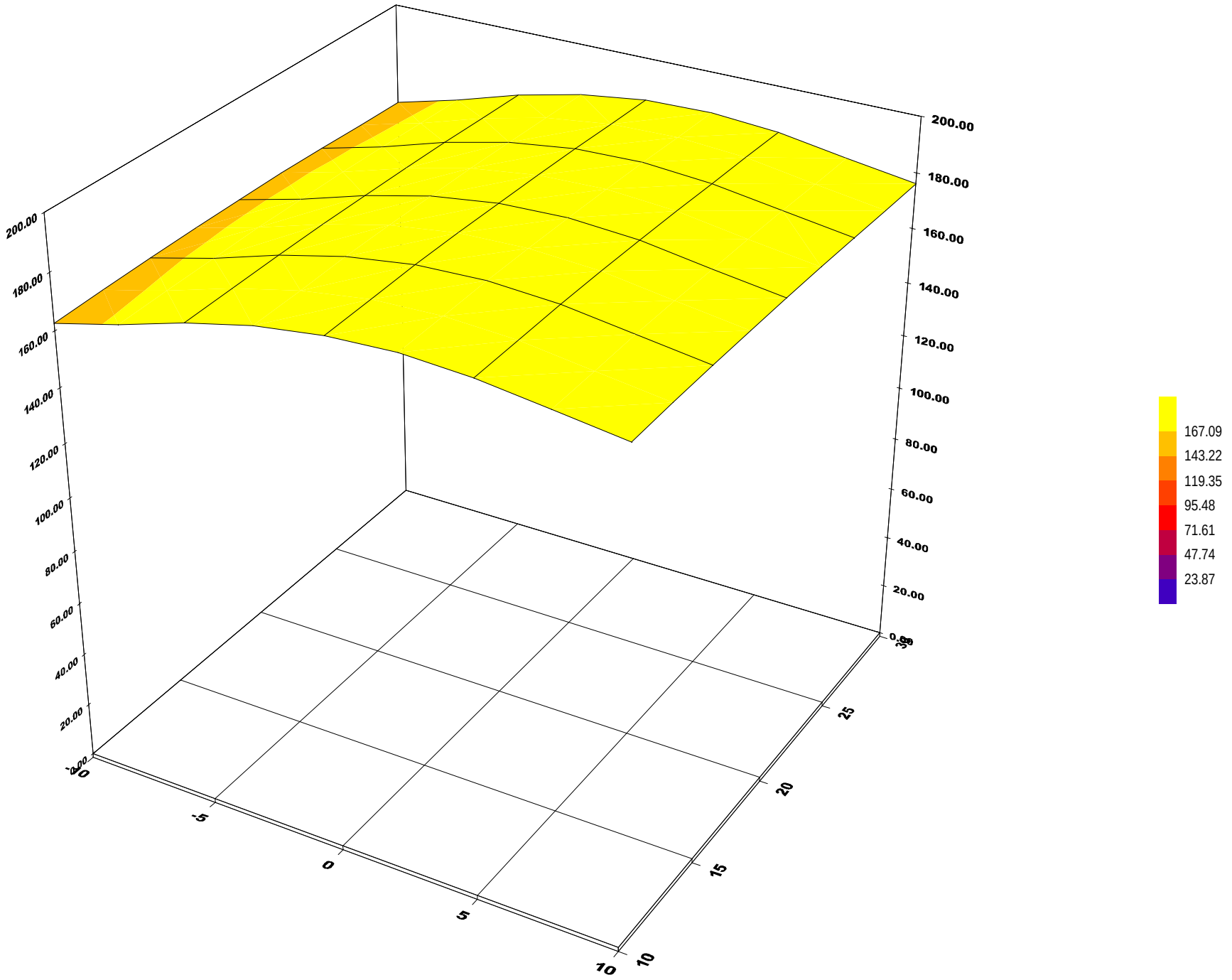
X = 0 Y = 20

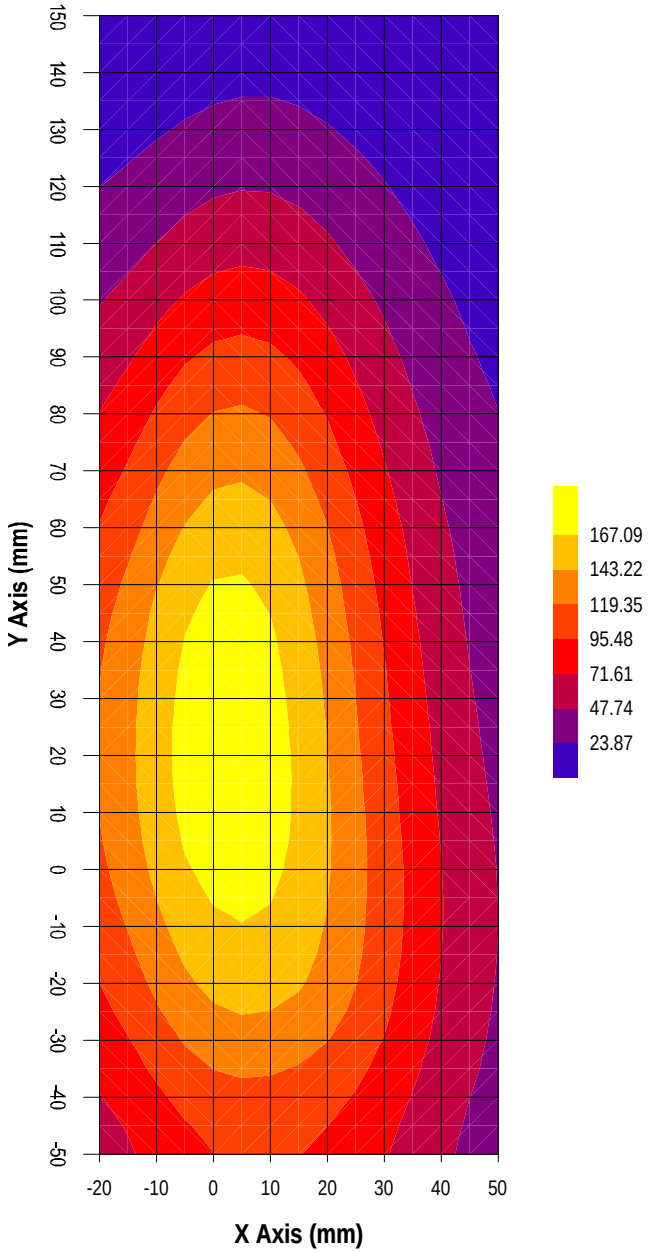
Measured Values (mV) :

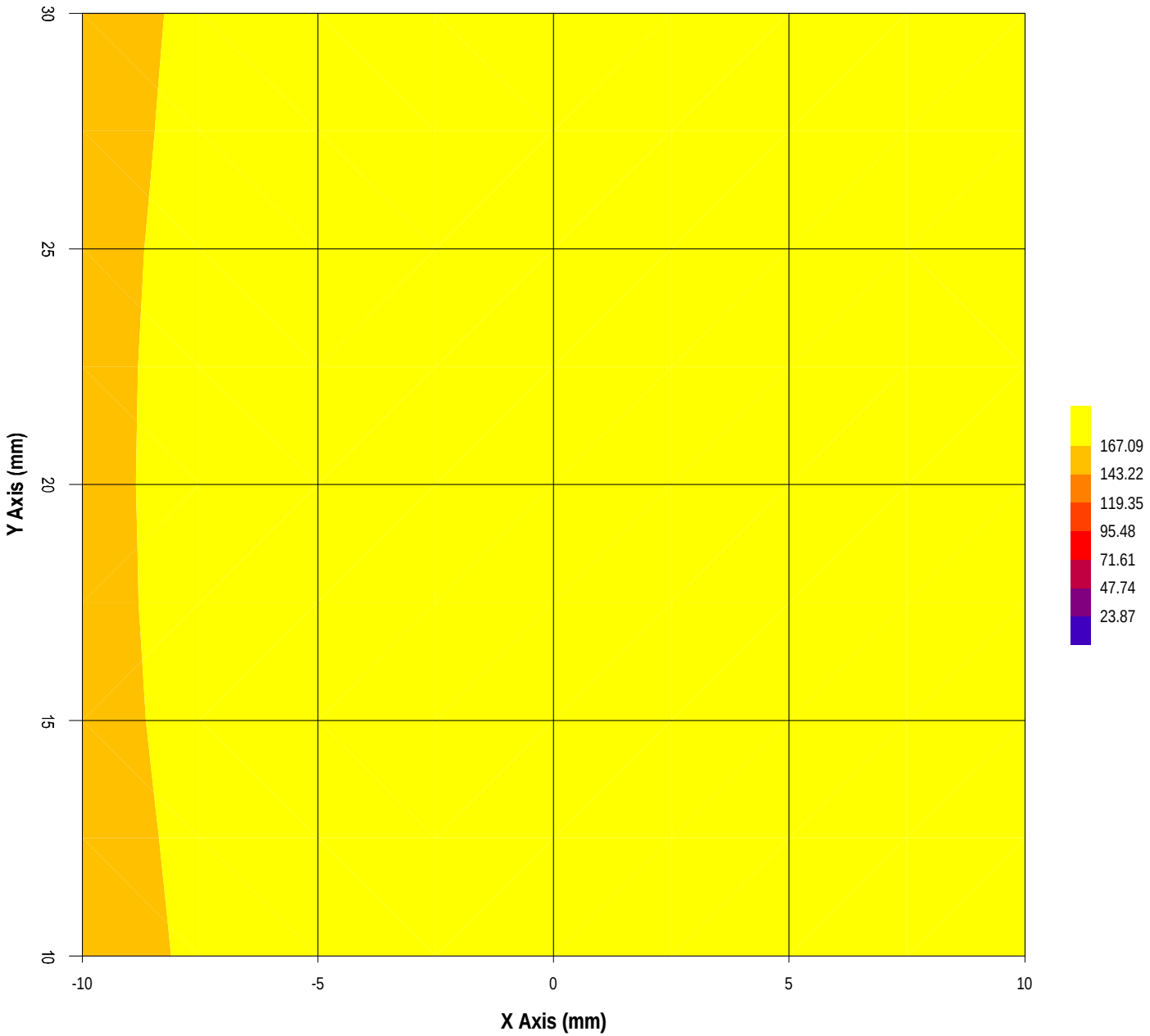
187.363	170.233	152.728	138.076	132.133	123.969
116.515	109.664	103.662	97.962	92.758	

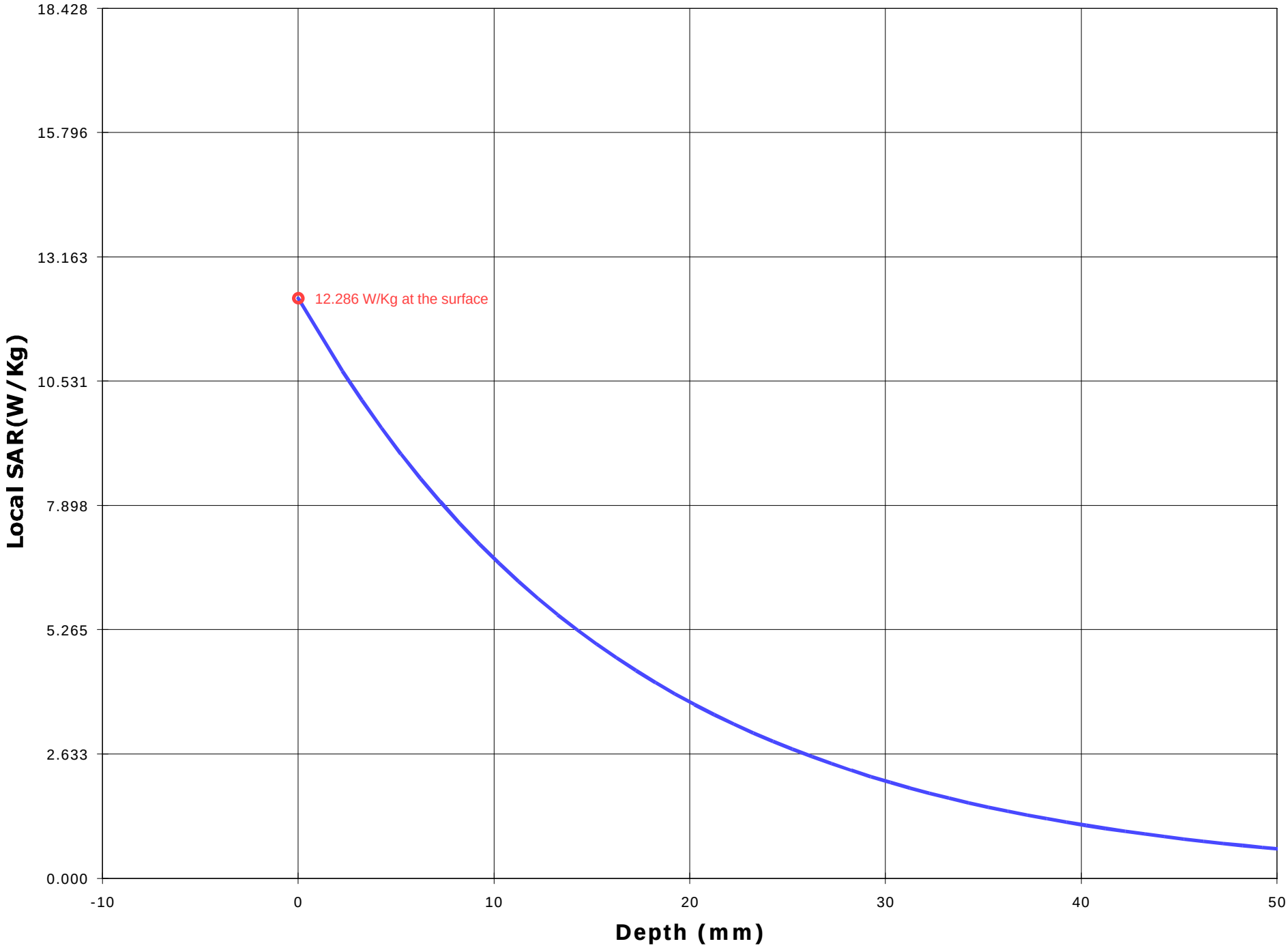
Peak Voltage (mV) : 206.513 **1 Cm Voltage (mV)** : 113.868 **SAR (W/Kg)** : 9.500


200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
-20 -10 0 10 20 30 40 50
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10 -20 -30 -40 -50
167.09
143.22
119.35
95.48
71.61
47.74
23.87


200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-5
0
5
10
15
20
25
167.09
143.22
119.35
95.48
71.61
47.74
23.87


Y Axis (mm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-20
-10
0
10
20
30
40
50
X Axis (mm)
167.09
143.22
119.35
95.48
71.61
47.74
23.87


Y Axis (mm)
30
25
20
15
10
-10
-5
0
5
10
X Axis (mm)
167.09
143.22
119.35
95.48
71.61
47.74
23.87


18.428
15.796
13.163
10.531
7.898
5.265
2.633
0.000
Local SAR(W/Kg)
12.286 W/Kg at the surface
-10
0
10
20
30
40
50
Depth (mm)

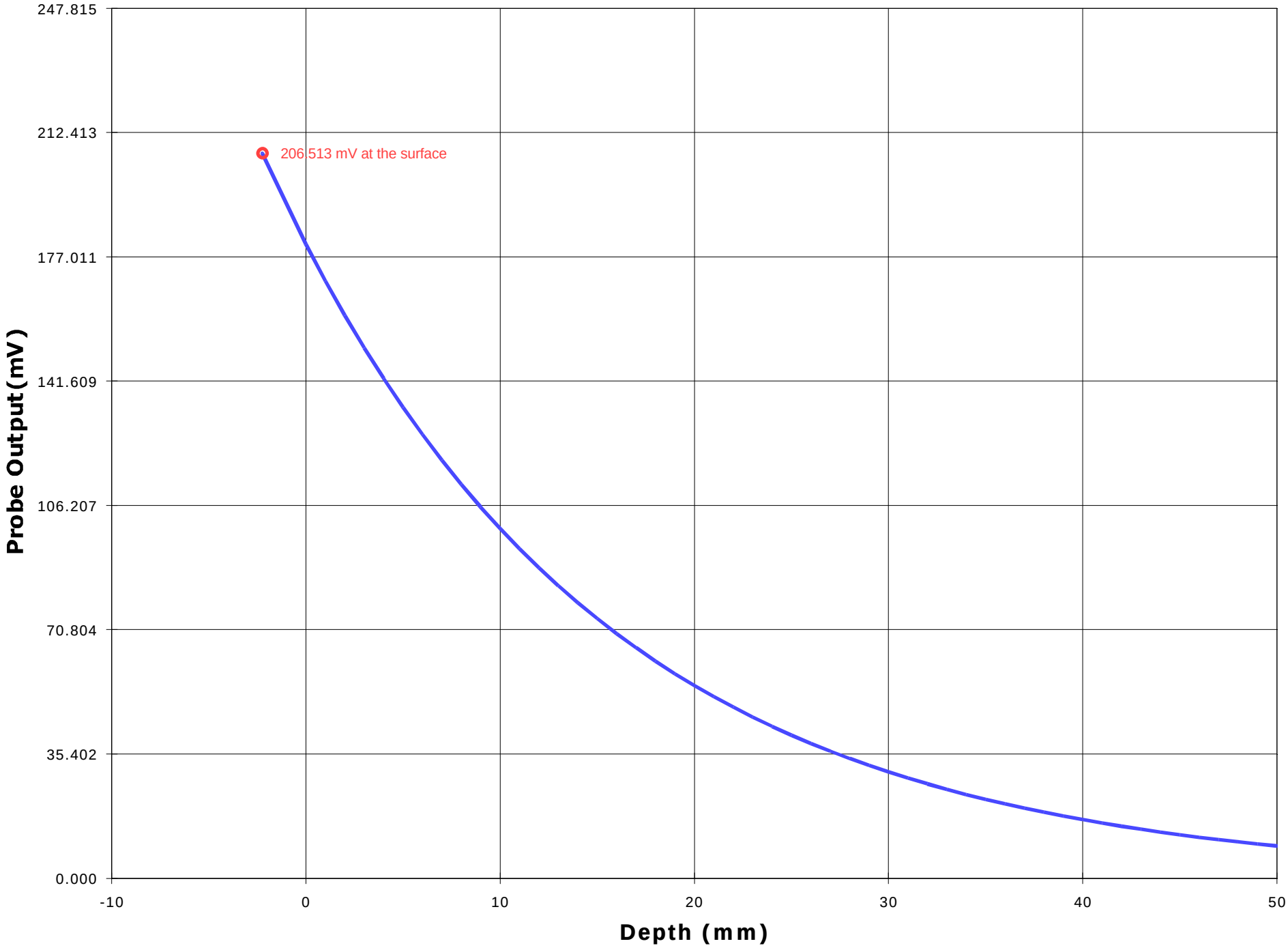

247.815
212.413
177.011
141.609
106.207
70.804
35.402
0.000
Probe Output (mV)
206.513 mV at the surface
-10
0
10
20
30
40
50
Depth (mm)

EXHIBIT 9. TISSUE CALIBRATION

The tissue conductivity was calibrated in accordance with IEEE Std 1528-200X, Draft 6.1 November 14, 2000, Sponsor IEEE SCC 34.

Ultratech Group of Labs.
3000 Bristol Circle Road
Oakville, Ontario
Canada L6H 6G4

Phone (905) 829-1570
FAX (905) 829-8050
Email vhk.ultratech@sympatico.ca

Name: Wayne **Date:** 11/16/2001

Frequency: 450 MHz **Mixture:** Muscle **Room Temp.:** 23.0 ±1°C

# of Points: 11 **Point Dist:** 1.0 cm

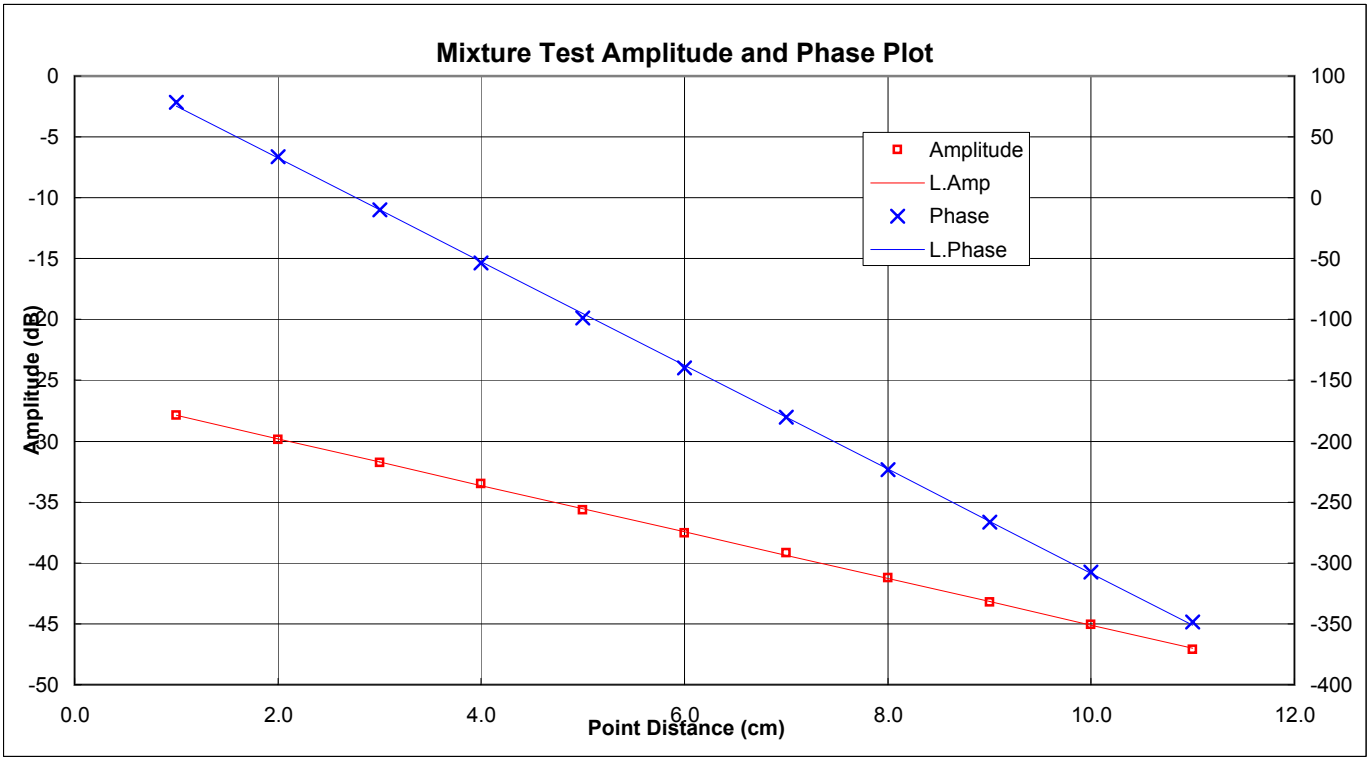
Point	Amplitude	Phase
1	-27.87	78.50
2	-29.86	33.67
3	-31.74	-9.87
4	-33.50	-53.35
5	-35.66	-98.66
6	-37.52	-139.81
7	-39.18	-179.99
8	-41.21	136.81
9	-43.24	93.33
10	-45.08	52.67
11	-47.09	11.34

Composition

	weight	% by weight
DI Water	36,365.0 g	51.76 %
Sucrose (98 %) ← Sugar	32,353.3 g	46.05 %
2-(2-ButoxyEthoxy) Ethanol ← Alcohol	0.0 g	0.00 %
Sodium Chloride (99+ %) ← Salt	1,338.1 g	1.90 %
Hydroxyethyl Cellulose ← HEC	150.0 g	0.21 %
Bactericide	50.0 g	0.07 %
1,2-propanedio	0.0 g	0.00 %
	0.0 g	0.00 %
	0.0 g	0.00 %
Total	70,256.4 g	100.00 %

Results:		Target	Low Limit	High Limit	% Off Target
D. Const:	56.84	56.70	53.865	59.535	0.24
Conductivity:	0.92	0.94	0.893	0.987	-1.83

ω(rad/sec)	2.827E+09
ε_0(F/m)	8.854E-12
μ(H/m)	1.257E-06
α_{avg}(Np/cm)	-0.22023
β_{avg}(rad/cm)	-0.74434



Ultratech Group of Labs.
3000 Bristol Circle Road
Oakville, Ontario
Canada L6H 6G4

Phone (905) 829-1570
FAX (905) 829-8050
Email vhk.ultratech@sympatico.ca

Name: Wayne **Date:** 11/20/2001

Frequency: 450 MHz **Mixture:** Brain **Room Temp.:** 23.0 ±1°C

# of Points: 11 **Point Dist:** 1.0 cm

Point	Amplitude	Phase
1	-24.42	163.55
2	-26.37	126.18
3	-28.52	87.50
4	-30.69	50.09
5	-32.72	12.95
6	-34.86	-24.86
7	-37.27	-64.76
8	-39.32	-100.81
9	-41.49	-139.59
10	-43.41	-175.80
11	-45.70	145.47

Composition

	weight	% by weight
DI Water	25,649.6 g	38.91 %
Sucrose (98 %) ← Sugar	37,171.2 g	56.38 %
2-(2-ButoxyEthoxy) Ethanol ← Alcohol	0.0 g	0.00 %
Sodium Chloride (99+ %) ← Salt	2,757.0 g	4.18 %
Hydroxyethyl Cellulose ← HEC	223.4 g	0.34 %
Bactericide	125.4 g	0.19 %
1,2-propanedio	0.0 g	0.00 %
	0.0 g	0.00 %
	0.0 g	0.00 %
Total	65,926.6 g	100.00 %

Results:		Target	Low Limit	High Limit	% Off Target
D. Const:	42.14	43.50	41.325	45.675	-3.12
Conductivity:	0.91	0.87	0.827	0.914	5.14

ω(rad/sec)	2.827E+09
ε_0(F/m)	8.854E-12
μ(H/m)	1.257E-06
α_{avg}(Np/cm)	-0.24625
β_{avg}(rad/cm)	-0.65991

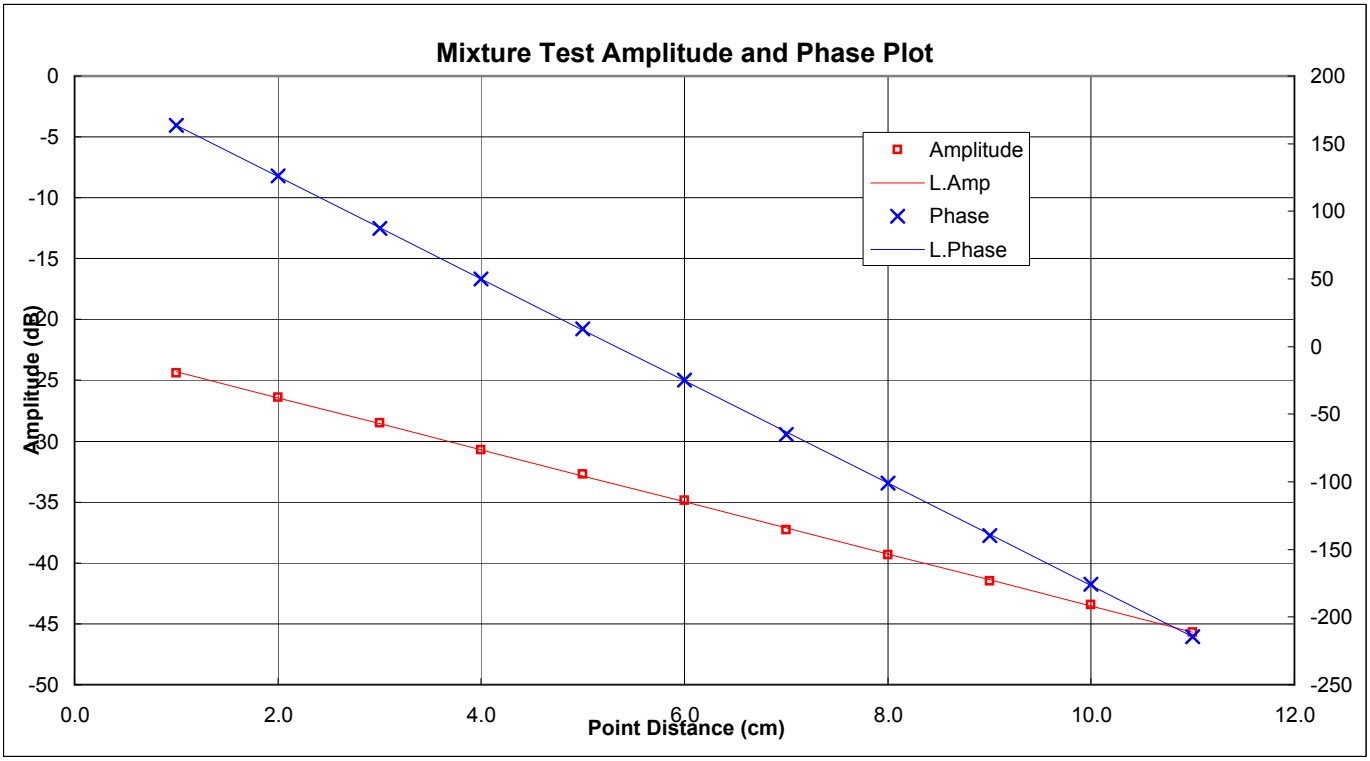
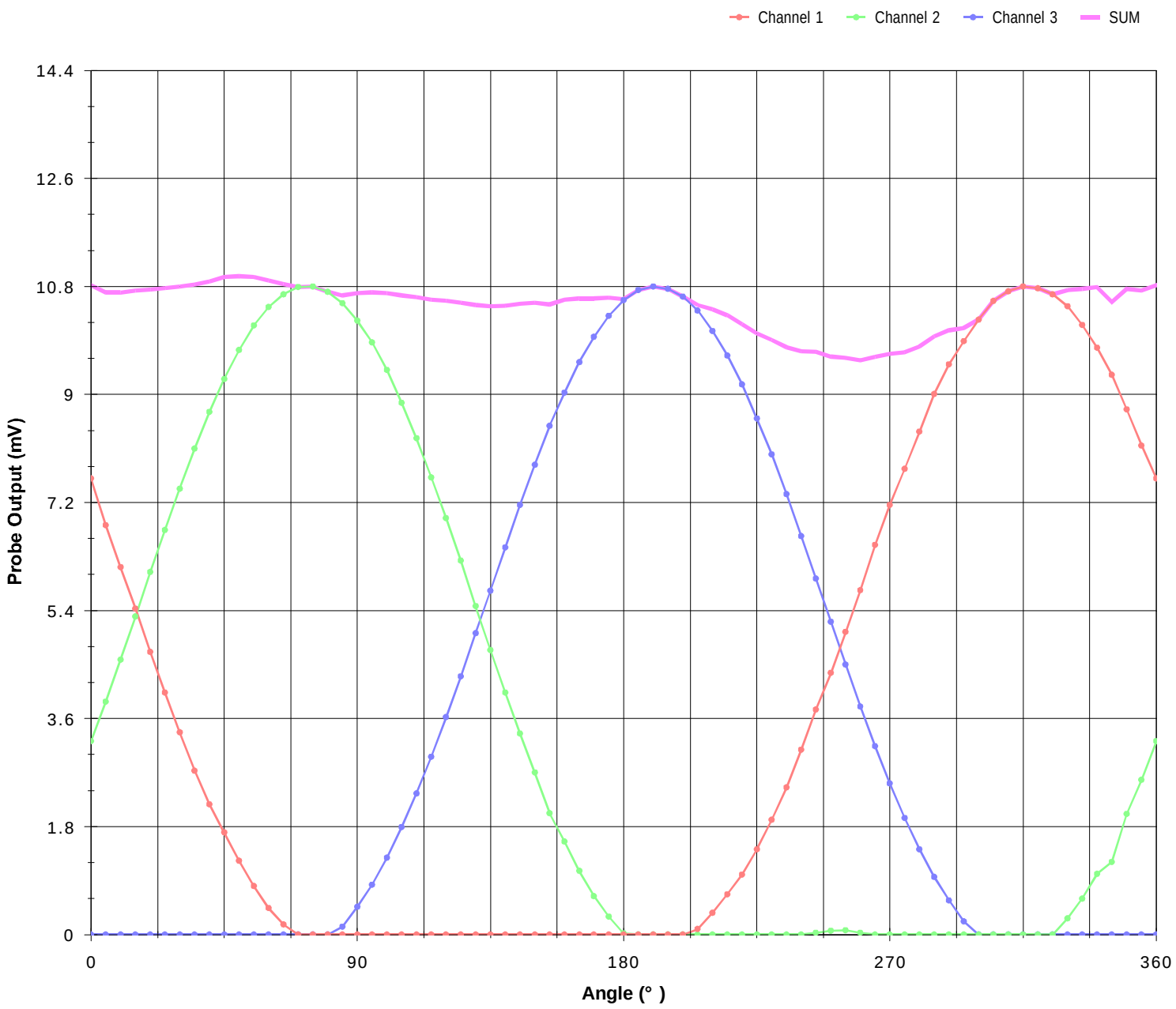


EXHIBIT 10. PROBE CALIBRATION FREE SPACE

Probe Name : UT-ETR-0200-1
Type : E-field (Triangular beam), Offset(mm) : 2.25
Frequency(MHz) : 450
Amplifier Setting : 0.00761099, 0.00697975, 0.00898502
Calibrated Date : 28/11/2001 12:43:51 PM



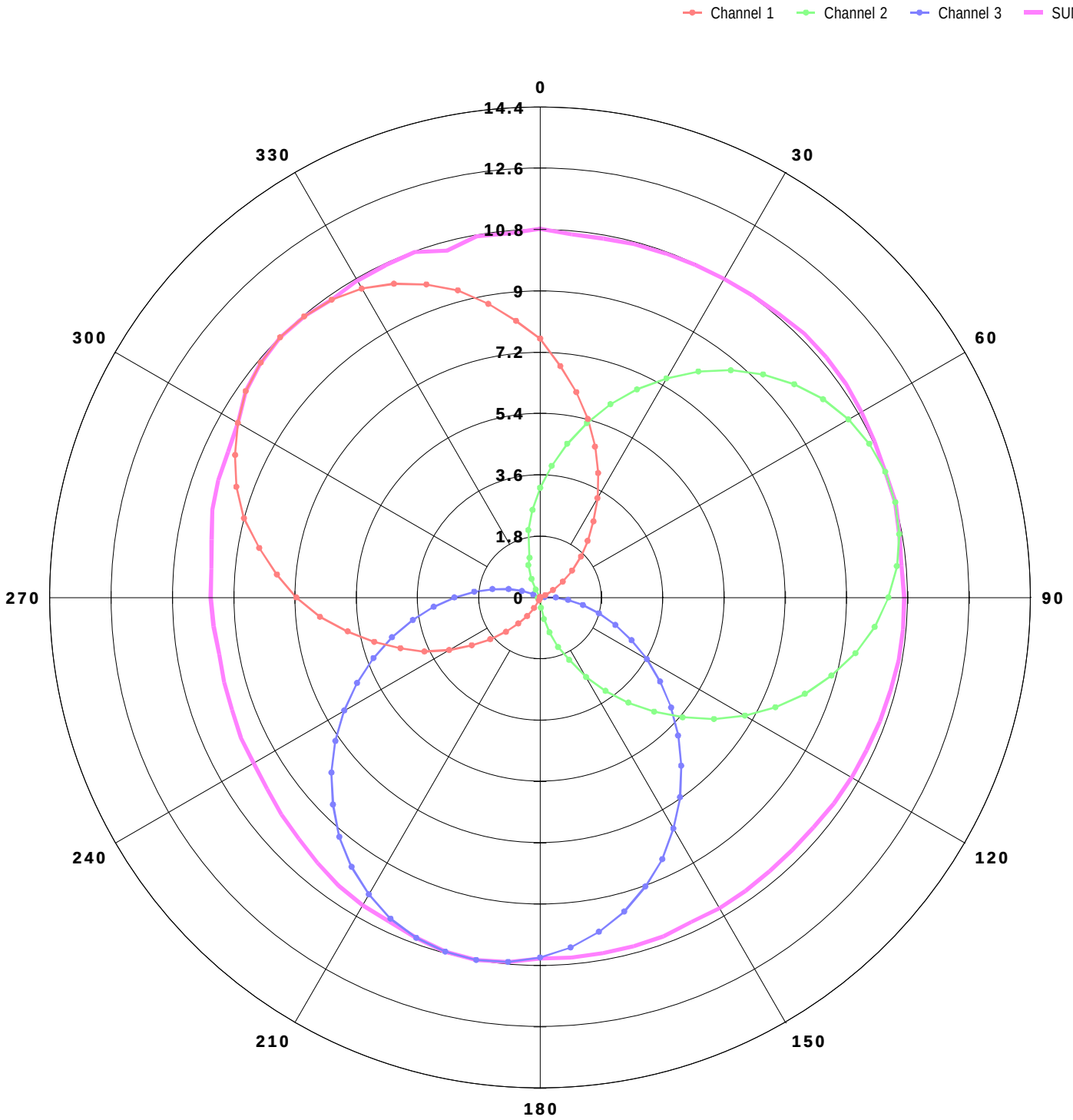
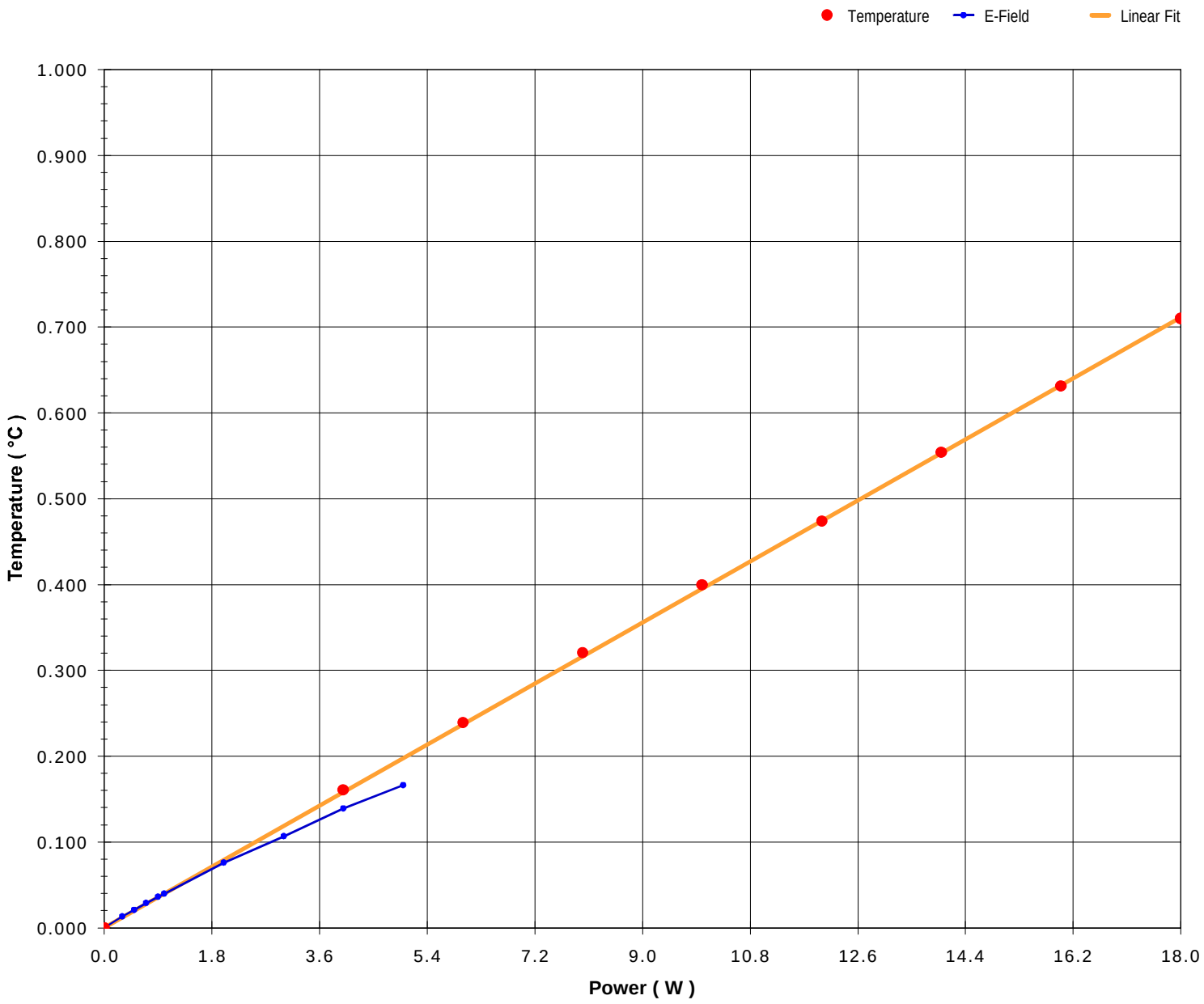

Channel 1
Channel 2
Channel 3
SUM
0
30
60
90
120
150
180
210
240
270
300
330
14.4
12.6
10.8
9
7.2
5.4
3.6
1.8
0

EXHIBIT 11. PROBE TEMPERATURE TRANSFER CALIBRATION FOR BODY TISSUE

Probe Name : UT-ETR-0200-1
Type : E-field (Triangular beam), Offset(mm) : 2.25
Frequency(MHz) : 450, Conversion Factor : 0.6425
Simulated Tissue Type : Muscle
Dielectrical Const. : 56.84, Conductivity : 0.92
Temperature - Simulated Tissue : 20.2°C, Room : 24°C
Calibrated Date : 29/11/2001 5:54:13 PM



E-Field & Diode Compensation

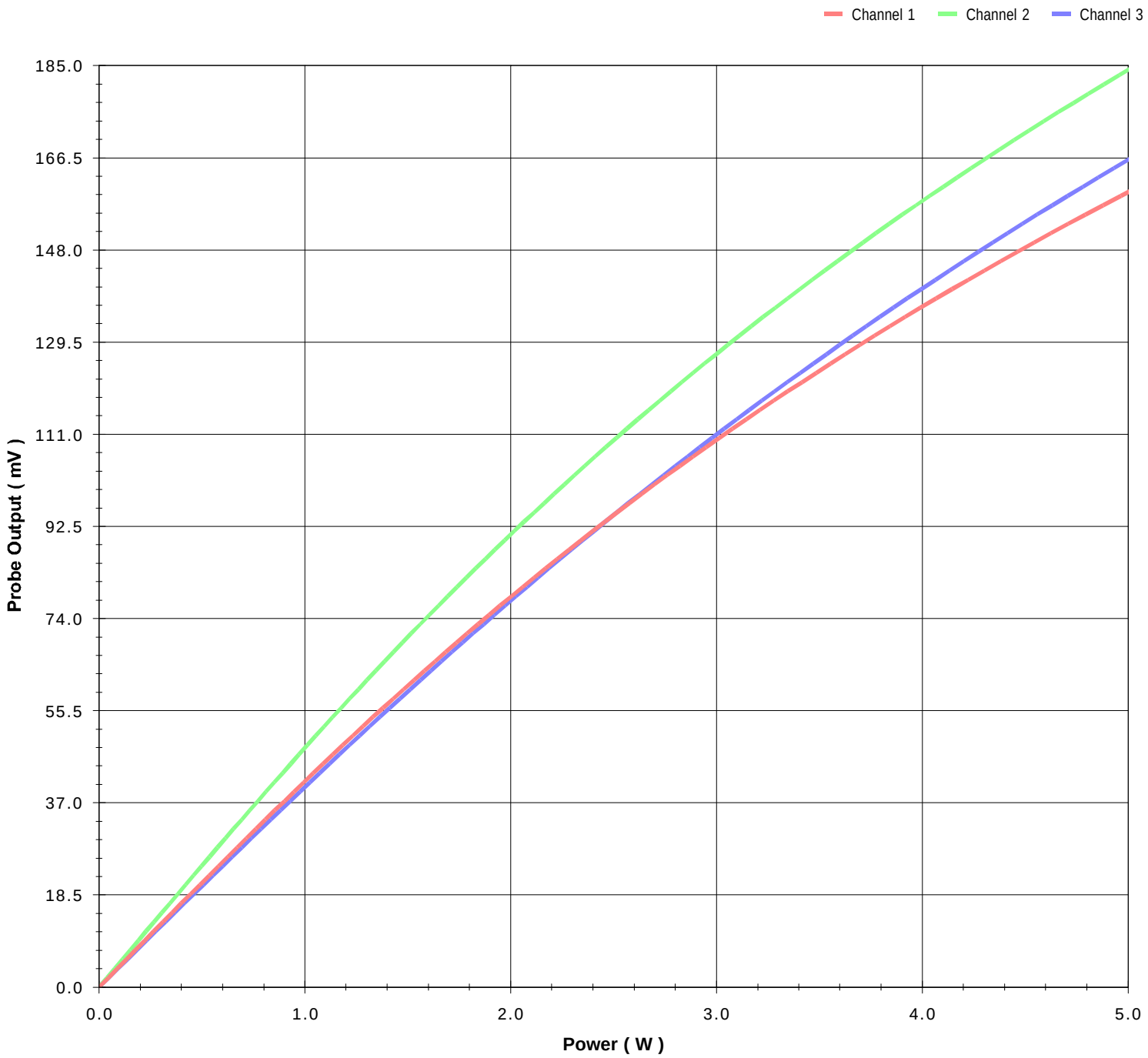
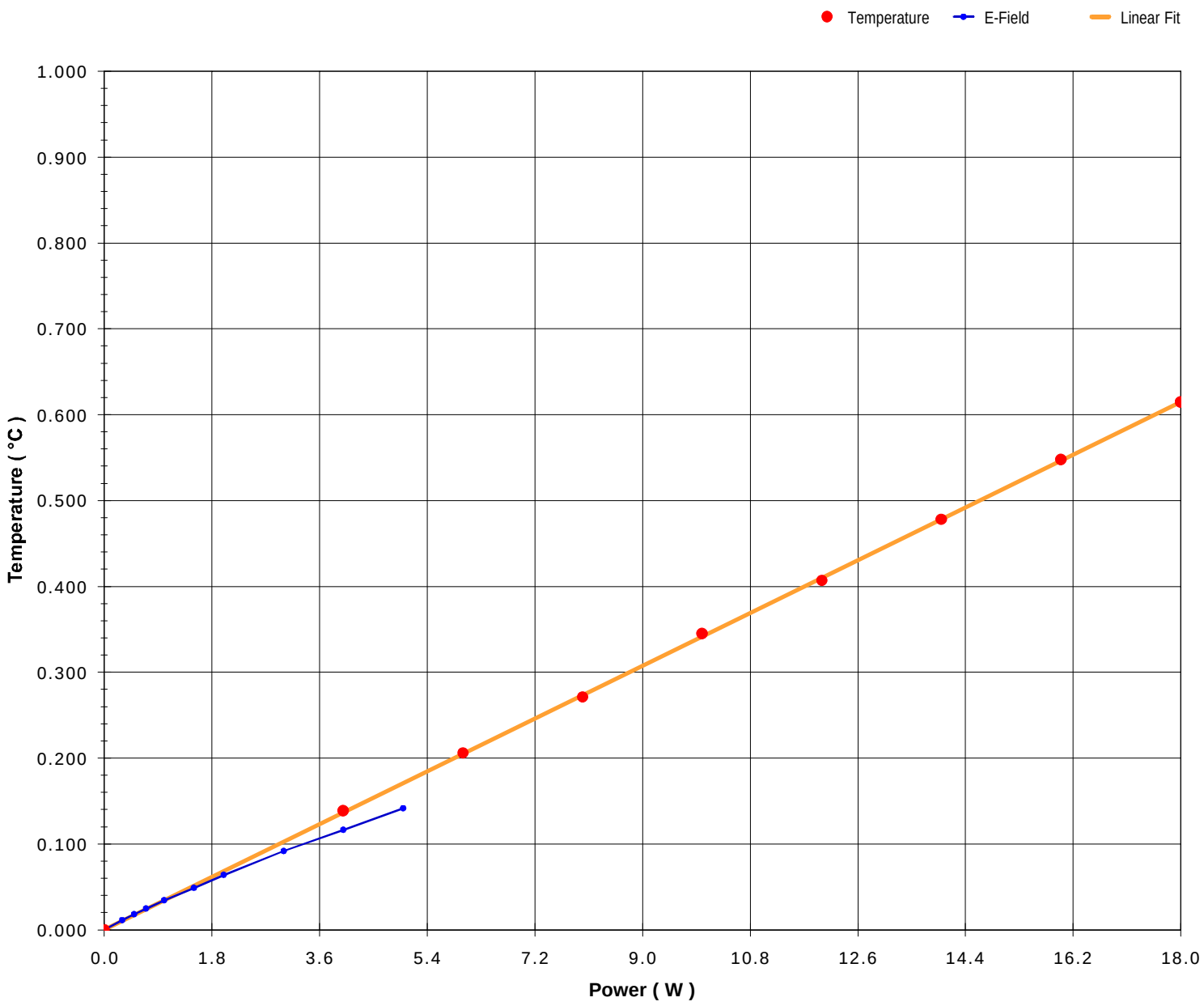


EXHIBIT 12. PROBE TEMPERATURE TRANSFER CALIBRATION FOR HEAD TISSUE

Probe Name : UT-ETR-0200-1
Type : E-field (Triangular beam), Offset(mm) : 2.25
Frequency(MHz) : 450, Conversion Factor : 0.4295
Simulated Tissue Type : Brain
Dielectrical Const. : 45.16, Conductivity : 0.90
Temperature - Simulated Tissue : 22.9°C, Room : 23.2°C
Calibrated Date : 27/11/2001 4:41:18 PM



E-Field & Diode Compensation