

**COMOSAR E-Field probe
Calibration Report**



Ref: CR-280-1-08-SATB-A

Page: 1/26

Issue: A

Date: 2012/10/04

COMOSAR E-FIELD PROBE CALIBRATION REPORT

Prepared By: LUC Jérôme, SATIMO

Project Description: SAR TEST BENCH

Prepared For (End User): Shenzhen Morlab Communication Technology

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COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 2/26

Issue: A

Date: 2012/10/04

COMOSAR SEPT ISOTROPIC E-FIELD PROBE CALIBRATION REPORT

DATE: 12/02/2009

REFERENCE: SN 37/08 EP80

OBJECT: COMOSAR SEPT ISOTROPIC E-FIELD PROBE

MANUFACTURER: SATIMO

SERIAL NUMBER: SN 37/08 EP80

CUSTOMER: Shenzhen Morlab Communication Technology

CONTRACT: PF2130108b_SAR_Morlab

DATE OF CALIBRATION: 04/10/2012

WARRANTY:

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Date

Oct. 04, 2012

SAR TEAM MANAGER

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29200 BREST

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 3/26

Issue: A

Date: 2012/10/04

PRODUCT DESCRIPTION



| | |
|---|--|
| Frequency Range | 100 MHz - 30 GHz |
| Probe length | 330 mm |
| Length of one dipole | 4.5 mm |
| Maximum external diameter | 8 mm |
| Probe extremity diameter | 6.5 mm |
| Distance between dipoles/probe extremity | < 2.7 mm |
| Resistance of the three dipole (at the connector) | Dipole 1: R1=1.4382 MΩ Dipole 2: R2=1.4894 MΩ Dipole 3: R3=1.4683 MΩ |
| Connector (HIROSE series SR30) | 6 wire male (Hirose SR30series) |

The probe could be checked by measuring the resistance of the three dipoles.

CALIBRATION TEST EQUIPMENT

| TYPE | IDENTIFICATION |
|-------------------|----------------|
| Calibration bench | CALISAR |
| Multimeter | Keithley 2000 |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

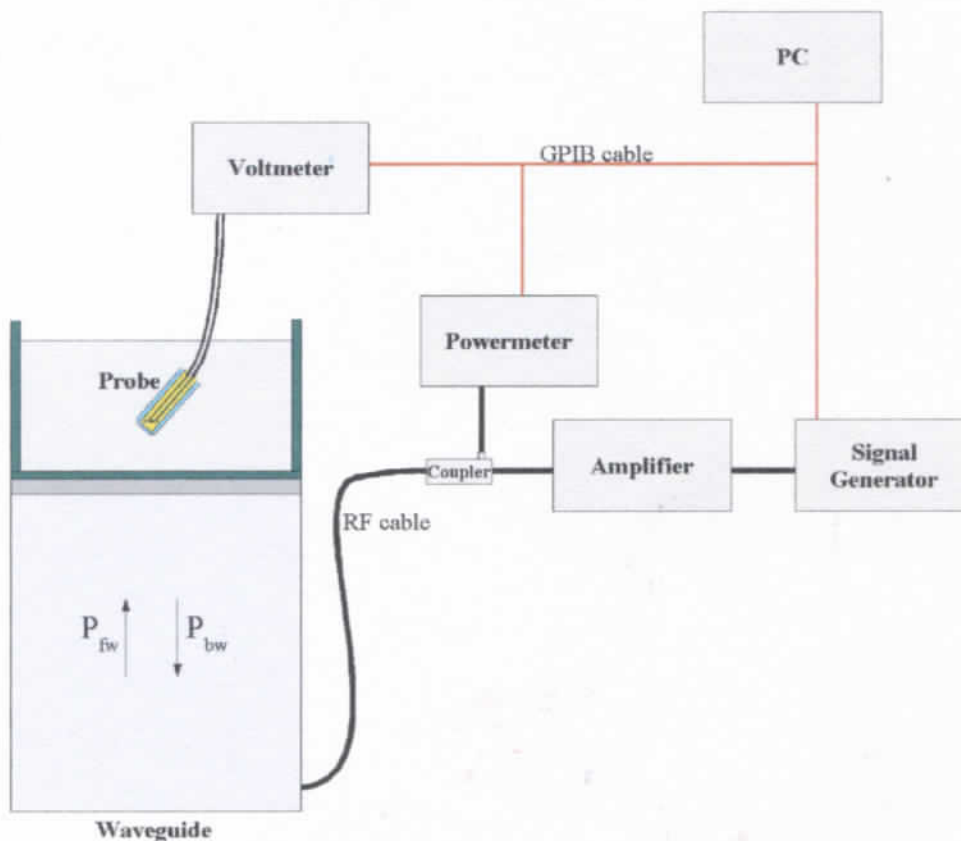
Page: 4/26

Issue: A

Date: 2012/10/04

MEASUREMENT PROCEDURE

Probe calibration is realized, in compliance with CENELEC EN 50361 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 50361 annexe technique using reference guide at the five frequencies.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\delta} \cos^2\left(\pi \frac{y}{a}\right) e^{-(2z/\delta)}$$

Where :

- P_{fw} = Forward Power
- P_{bw} = Backward Power
- a and b = Waveguide dimensions
- δ = Skin depth

Keithley configuration:

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO

After each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 5/26

Issue: A

Date: 2012/10/04

PROBE UNCERTAINTIES

Calibration report of dosimetric SATIMO probe

Uncertainty on calibration system

| ERROR SOURCES | Uncertainty value (%) | Probability Distribution | Divisor | ci | Standard Uncertainty (%) |
|--|-----------------------|--------------------------|------------|----|--------------------------|
| Incident or forward power | 3,00% | Rectangular | $\sqrt{3}$ | 1 | 1,732% |
| Reflected power | 3,00% | Rectangular | $\sqrt{3}$ | 1 | 1,732% |
| Liquid conductivity | 5,00% | Rectangular | $\sqrt{3}$ | 1 | 2,887% |
| Liquid permittivity | 4,00% | Rectangular | $\sqrt{3}$ | 1 | 2,309% |
| Field homogeneity | 3,00% | Rectangular | $\sqrt{3}$ | 1 | 1,732% |
| Field probe positioning | 5,00% | Rectangular | $\sqrt{3}$ | 1 | 2,887% |
| Field probe linearity | 3,00% | Rectangular | $\sqrt{3}$ | 1 | 1,732% |
| Combined standard uncertainty | | | | | 4,761% |
| Expanded uncertainty (confidence interval of 95%) | | | | | 9,331% |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 6/26

Issue: A

Date: 2012/10/04

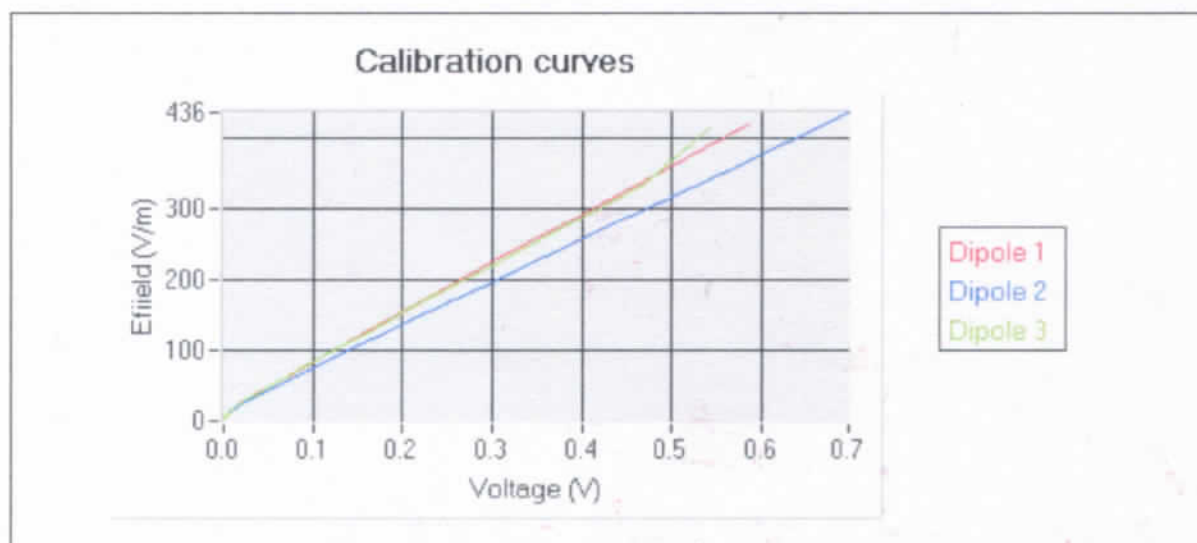
1. Calibration at 450.00 MHz

A. Calibration parameters.

| | |
|--------------------------|-----------------------|
| Label | GSM450 |
| Epsilon | 43.33 |
| Sigma | 0.84 S/m |
| Temperature | 21°C |
| Antenna gain | 2.03 dB |
| Antenna S11 | -10.50 dB |
| Low limit detection (CW) | 0.72 V/m (0.47 mW/kg) |

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 * E_2^2 * E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 7/26

Issue: A

Date: 2012/10/04

Calibration coefficients for the three dipoles in CW:

| v1 | e1 | v2 | e2 | v3 | e3 |
|-----------|------------|-----------|------------|----------|------------|
| 0.584004 | 419.557857 | -0.696059 | 435.622023 | 0.541191 | 412.830715 |
| 0.467833 | 339.207465 | -0.556278 | 351.381991 | 0.469757 | 336.297240 |
| 0.376994 | 276.348283 | -0.452232 | 288.647980 | 0.378826 | 274.224190 |
| 0.302778 | 224.954643 | -0.359005 | 232.397390 | 0.305842 | 224.365698 |
| 0.241038 | 182.154071 | -0.286978 | 188.889931 | 0.246562 | 183.825274 |
| 0.192549 | 148.484090 | -0.230386 | 154.650994 | 0.195712 | 148.993075 |
| 0.154033 | 121.674762 | -0.185412 | 127.378480 | 0.157543 | 122.783107 |
| 0.123397 | 100.276479 | -0.147311 | 104.193802 | 0.125866 | 100.956090 |
| 0.099878 | 83.770361 | -0.118637 | 86.660489 | 0.101471 | 84.063863 |
| 0.081165 | 70.553219 | -0.095250 | 72.263937 | 0.082289 | 70.694342 |
| 0.065166 | 59.152028 | -0.076788 | 60.795323 | 0.066427 | 59.538957 |
| 0.051916 | 49.592416 | -0.061280 | 51.041514 | 0.053353 | 50.232492 |
| 0.041968 | 42.297602 | -0.048746 | 43.022565 | 0.042906 | 42.675214 |
| 0.033724 | 36.126757 | -0.039149 | 36.748110 | 0.034686 | 36.605243 |
| 0.021855 | 26.962568 | -0.024798 | 27.024723 | 0.022272 | 27.149463 |
| 0.018405 | 23.975145 | -0.020856 | 24.085809 | 0.018755 | 24.141334 |
| 0.015467 | 21.515985 | -0.017534 | 21.515985 | 0.015767 | 21.615299 |
| 0.013018 | 19.309065 | -0.014750 | 19.398191 | 0.013276 | 19.487731 |
| 0.010938 | 17.408496 | -0.012392 | 17.529166 | 0.011157 | 17.569575 |
| 0.009022 | 15.586953 | -0.010228 | 15.658899 | 0.009215 | 15.676938 |
| 0.007353 | 13.956010 | -0.008328 | 13.988181 | 0.007484 | 14.020428 |
| 0.005989 | 12.466979 | -0.006801 | 12.495719 | 0.006111 | 12.567858 |
| 0.004890 | 11.214019 | -0.005573 | 11.265779 | 0.005003 | 11.330818 |
| 0.004019 | 10.133541 | -0.004570 | 10.121882 | 0.004099 | 10.168601 |
| 0.003279 | 9.094132 | -0.003739 | 9.157170 | 0.003352 | 9.125596 |
| 0.002660 | 8.095827 | -0.003041 | 8.293946 | 0.002769 | 8.265350 |
| 0.002126 | 7.324219 | -0.002453 | 7.366500 | 0.002188 | 7.358024 |
| 0.001685 | 6.565400 | -0.001947 | 6.580536 | 0.001724 | 6.542765 |
| 0.001300 | 5.784440 | -0.001511 | 5.718225 | 0.001334 | 5.757862 |
| 0.001123 | 5.245191 | -0.001307 | 5.269400 | 0.001174 | 5.275471 |
| 0.000891 | 4.701768 | -0.001057 | 4.723470 | 0.000924 | 4.728912 |
| 0.000704 | 4.209798 | -0.000850 | 4.226839 | 0.000736 | 4.243862 |
| 0.000574 | 3.790376 | -0.000689 | 3.791428 | 0.000603 | 3.830551 |
| 0.000457 | 3.396200 | -0.000570 | 3.434303 | 0.000483 | 3.421852 |
| 0.000365 | 3.050686 | -0.000463 | 3.078014 | 0.000389 | 3.079630 |
| 0.000292 | 2.745766 | -0.000369 | 2.726866 | 0.000311 | 2.759206 |
| 0.000236 | 2.486639 | -0.000312 | 2.489933 | 0.000246 | 2.460514 |
| 0.000169 | 2.135693 | -0.000243 | 2.168759 | 0.000192 | 2.181488 |
| 0.000128 | 1.889049 | -0.000187 | 1.867932 | 0.000150 | 1.936874 |
| 0.000095 | 1.664186 | -0.000151 | 1.645758 | 0.000107 | 1.649268 |
| 0.000060 | 1.386399 | -0.000126 | 1.471869 | 0.000084 | 1.472551 |
| 0.000058 | 1.368824 | -0.000108 | 1.332695 | 0.000065 | 1.308691 |
| 0.000037 | 1.168432 | -0.000085 | 1.130188 | 0.000050 | 1.163135 |
| 0.000024 | 1.024929 | -0.000073 | 1.008517 | 0.000039 | 1.043570 |
| 0.000020 | 0.976541 | -0.000060 | 0.857441 | 0.000027 | 0.895101 |
| 0.000008 | 0.814304 | -0.000053 | 0.763814 | 0.000017 | 0.749230 |
| 0.000004 | 0.752492 | -0.000046 | 0.659669 | 0.000015 | 0.716502 |
| -0.000002 | 0.651238 | -0.000041 | 0.565593 | 0.000013 | 0.682204 |
| -0.000007 | 0.553830 | -0.000037 | 0.480995 | 0.000001 | 0.421392 |
| -0.000010 | 0.477516 | -0.000034 | 0.413108 | | |
| -0.000012 | 0.410144 | | | | |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 8/26

Issue: A

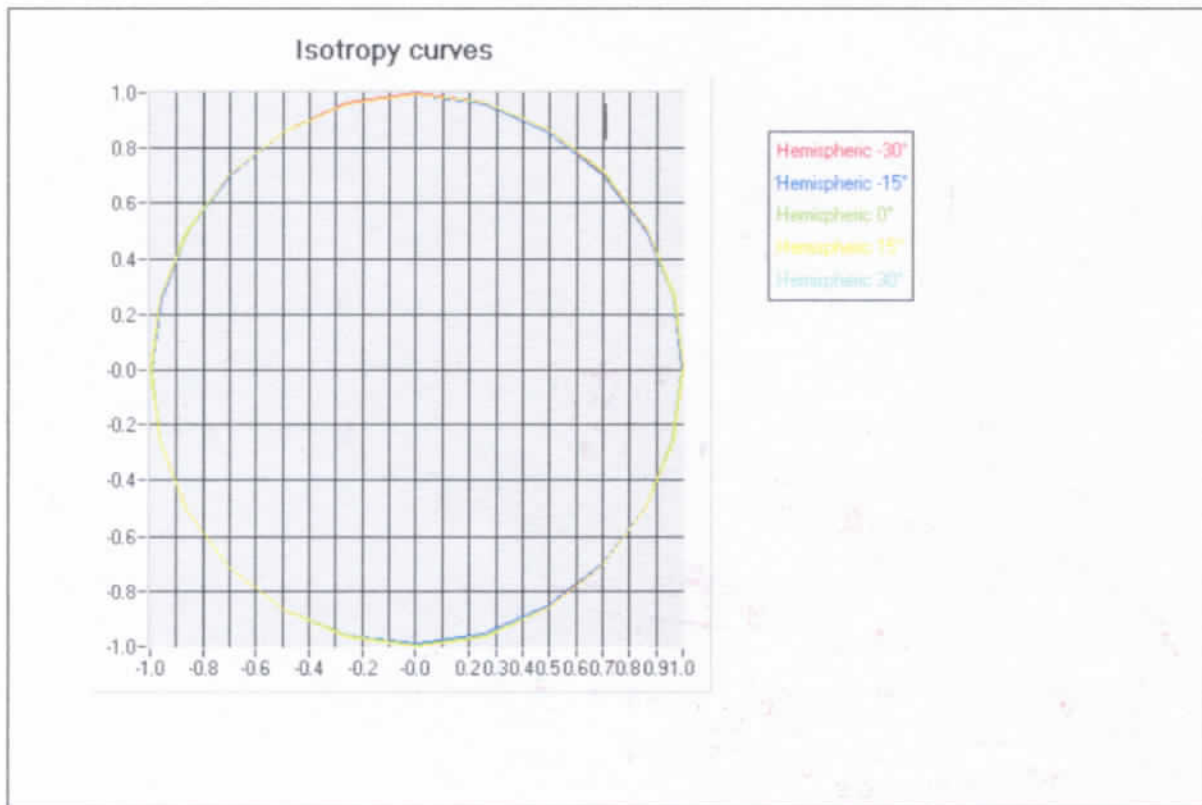
Date: 2011/10/04

Sensitivity in liquid:

| Liquid | ϵ | σ | CF dipole 1 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 2 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 3 (W.kg^{-1} (mV^{-1}) ⁻¹) |
|--------|------------|----------|---|---|---|
| Head | 43.50 | 0.87 | 24.451 | 22.393 | 24.045 |
| Body | 58.00 | 0.83 | 24.691 | 22.414 | 24.201 |

B. Isotropy.

- Axial isotropy: 0.03 dB
- Hemispherical isotropy: 0.03 dB



C. Linearity.

- Linearity: 0.05 dB

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 9/26

Issue: A

Date: 2012/10/04

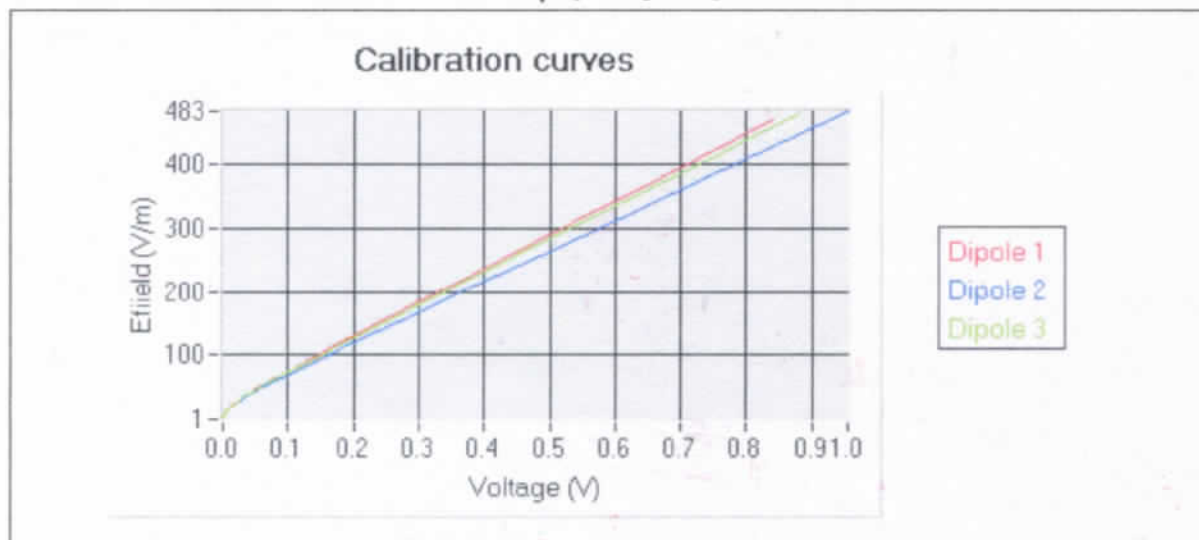
2. Calibration at 835.00 MHz

A. Calibration parameters.

| | |
|---------------------|-----------------------|
| Label | 850 |
| Epsilon | 43.40 |
| Sigma | 0.89 S/m |
| Temperature | 21°C |
| Cable loss | 0.11 dB |
| Coupler loss | 20.50 dB |
| Waveguide S11 | -20.90 dB |
| Low limit detection | 0.92 V/m (0.75 mW/kg) |

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 * E_2^2 * E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 10/26

Issue: A

Date: 2012/10/04

Calibration coefficients for the three dipoles in CW:

| v1 | e1 | v2 | e2 | v3 | e3 |
|-----------|------------|-----------|------------|----------|------------|
| 0.839252 | 469.730948 | -0.954847 | 482.718447 | 0.879546 | 479.683033 |
| 0.668119 | 379.166614 | -0.762014 | 390.347498 | 0.698229 | 385.999214 |
| 0.533716 | 307.961972 | -0.606148 | 315.607901 | 0.558143 | 313.544664 |
| 0.426955 | 251.311080 | -0.486812 | 258.298379 | 0.448077 | 256.531927 |
| 0.342037 | 206.144479 | -0.387670 | 210.582203 | 0.360609 | 211.126634 |
| 0.276846 | 171.355772 | -0.308360 | 172.284375 | 0.286505 | 172.535979 |
| 0.180629 | 118.178721 | -0.197173 | 118.042741 | 0.185251 | 118.178721 |
| 0.163497 | 109.153907 | -0.178754 | 109.153907 | 0.167665 | 109.153907 |
| 0.145275 | 99.549546 | -0.159179 | 99.549546 | 0.149045 | 99.549546 |
| 0.127277 | 89.957894 | -0.139807 | 89.957894 | 0.130662 | 89.854386 |
| 0.110307 | 80.730805 | -0.121434 | 80.730805 | 0.113306 | 80.637914 |
| 0.094797 | 72.200346 | -0.104643 | 72.200346 | 0.097445 | 72.117272 |
| 0.081814 | 64.944037 | -0.090598 | 64.869310 | 0.084174 | 64.869310 |
| 0.069641 | 57.948111 | -0.077338 | 57.881434 | 0.071699 | 57.881434 |
| 0.058878 | 51.586883 | -0.065586 | 51.586883 | 0.060658 | 51.527524 |
| 0.049536 | 45.976857 | -0.055336 | 45.976857 | 0.051073 | 45.923955 |
| 0.041505 | 40.976917 | -0.046508 | 40.976917 | 0.042828 | 40.929767 |
| 0.034714 | 36.604905 | -0.039026 | 36.562786 | 0.035889 | 36.562786 |
| 0.028810 | 32.586617 | -0.032462 | 32.586617 | 0.029795 | 32.586617 |
| 0.023825 | 29.076310 | -0.026929 | 29.076310 | 0.024666 | 29.076310 |
| 0.019557 | 25.914289 | -0.022164 | 25.914289 | 0.020277 | 25.914289 |
| 0.015950 | 23.069558 | -0.018115 | 23.043013 | 0.016542 | 23.043013 |
| 0.013090 | 20.655670 | -0.014875 | 20.631903 | 0.013571 | 20.631903 |
| 0.010616 | 18.409385 | -0.012100 | 18.388202 | 0.011028 | 18.388202 |
| 0.008582 | 16.407381 | -0.009802 | 16.388503 | 0.008915 | 16.388503 |
| 0.006917 | 14.623094 | -0.007914 | 14.623094 | 0.007191 | 14.606268 |
| 0.005549 | 13.017850 | -0.006351 | 13.017850 | 0.005768 | 13.002872 |
| 0.004461 | 11.628917 | -0.005124 | 11.628917 | 0.004648 | 11.615537 |
| 0.003564 | 10.352358 | -0.004108 | 10.352358 | 0.003719 | 10.352358 |
| 0.002836 | 9.226549 | -0.003286 | 9.226549 | 0.002977 | 9.226549 |
| 0.002259 | 8.223170 | -0.002617 | 8.213708 | 0.002375 | 8.213708 |
| 0.001802 | 7.320476 | -0.002093 | 7.320476 | 0.001895 | 7.320476 |
| 0.001429 | 6.532638 | -0.001685 | 6.554495 | 0.001523 | 6.554495 |
| 0.001138 | 5.840422 | -0.001336 | 5.834979 | 0.001210 | 5.834979 |
| 0.000899 | 5.203480 | -0.001071 | 5.206420 | 0.000963 | 5.193805 |
| 0.000715 | 4.654101 | -0.000853 | 4.640227 | 0.000762 | 4.623419 |
| 0.000576 | 4.191605 | -0.000682 | 4.135607 | 0.000613 | 4.150307 |
| 0.000451 | 3.726997 | -0.000549 | 3.707142 | 0.000502 | 3.759352 |
| 0.000357 | 3.335245 | -0.000440 | 3.296394 | 0.000387 | 3.305900 |
| 0.000263 | 2.890885 | -0.000359 | 2.958281 | 0.000306 | 2.944897 |
| 0.000207 | 2.590175 | -0.000279 | 2.627855 | 0.000247 | 2.651180 |
| 0.000157 | 2.288534 | -0.000229 | 2.368777 | 0.000190 | 2.332553 |
| 0.000132 | 2.121692 | -0.000183 | 2.102414 | 0.000152 | 2.093365 |
| 0.000110 | 1.963178 | -0.000153 | 1.908778 | 0.000119 | 1.860869 |
| 0.000075 | 1.680457 | -0.000121 | 1.677779 | 0.000103 | 1.736978 |
| 0.000064 | 1.581195 | -0.000093 | 1.445687 | 0.000078 | 1.523360 |
| 0.000029 | 1.212454 | -0.000085 | 1.372183 | 0.000059 | 1.338399 |
| 0.000016 | 1.039547 | -0.000076 | 1.284474 | 0.000047 | 1.207065 |
| 0.000006 | 0.888771 | -0.000061 | 1.123173 | 0.000040 | 1.123386 |
| -0.000001 | 0.763681 | -0.000055 | 1.051749 | 0.000027 | 0.953273 |
| -0.000006 | 0.660920 | -0.000046 | 0.934431 | 0.000019 | 0.820744 |
| -0.000010 | 0.562064 | -0.000046 | 0.934431 | 0.000013 | 0.708836 |
| | | -0.000034 | 0.749985 | 0.000008 | 0.607750 |
| | | -0.000034 | 0.749985 | 0.000004 | 0.516845 |
| | | -0.000026 | 0.596115 | | |
| | | -0.000022 | 0.509470 | | |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 11/26

Issue: A

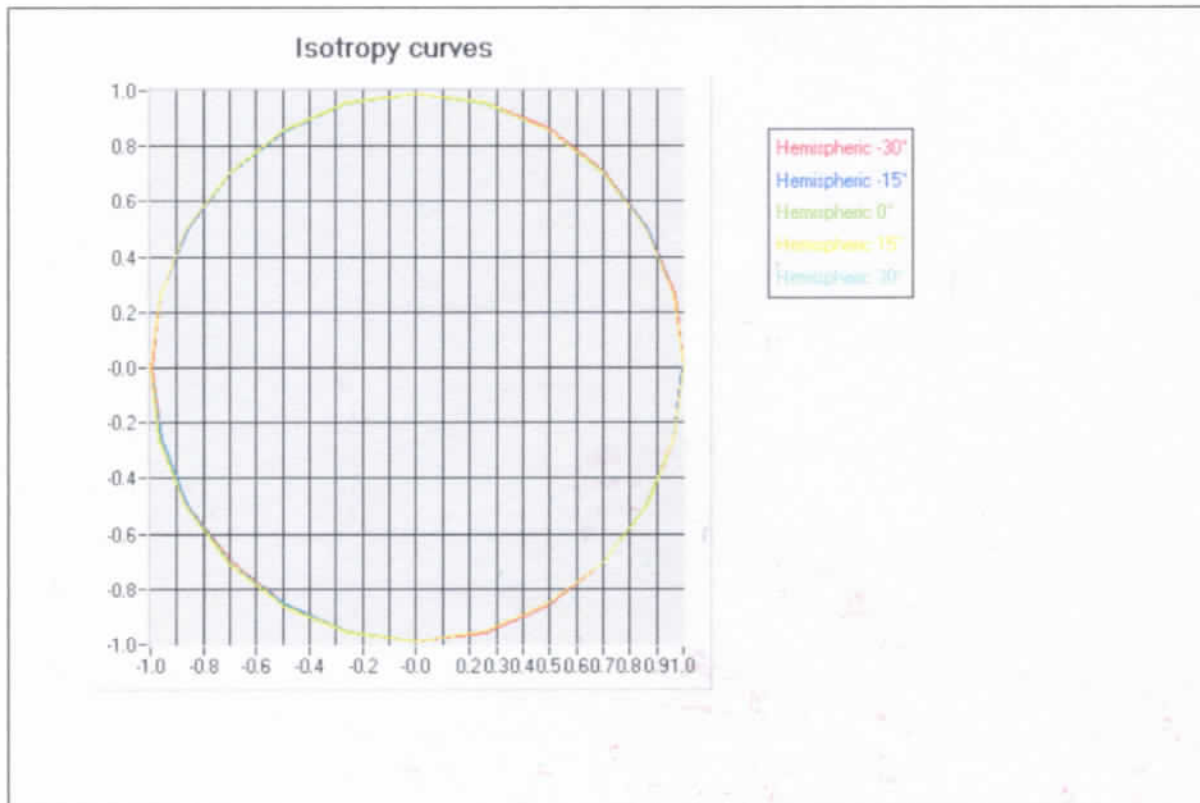
Date: 2012/10/04

Sensitivity in liquid:

| Liquid | ϵ | σ | CF dipole 1 (W.kg^{-1} (mV^{-1})) | CF dipole 2 (W.kg^{-1} (mV^{-1})) | CF dipole 3 (W.kg^{-1} (mV^{-1})) |
|--------|------------|----------|--|--|--|
| Head | 41.50 | 0.90 | 28.479 | 25.214 | 27.196 |
| Body | 56.10 | 0.95 | 28.559 | 25.681 | 27.588 |

B. Isotropy.

- Axial isotropy: 0.04 dB
- Hemispherical isotropy: 0.04 dB



C. Linearity.

- Linearity: 0.07 dB

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 12/26

Issue: A

Date: 2012/10/04

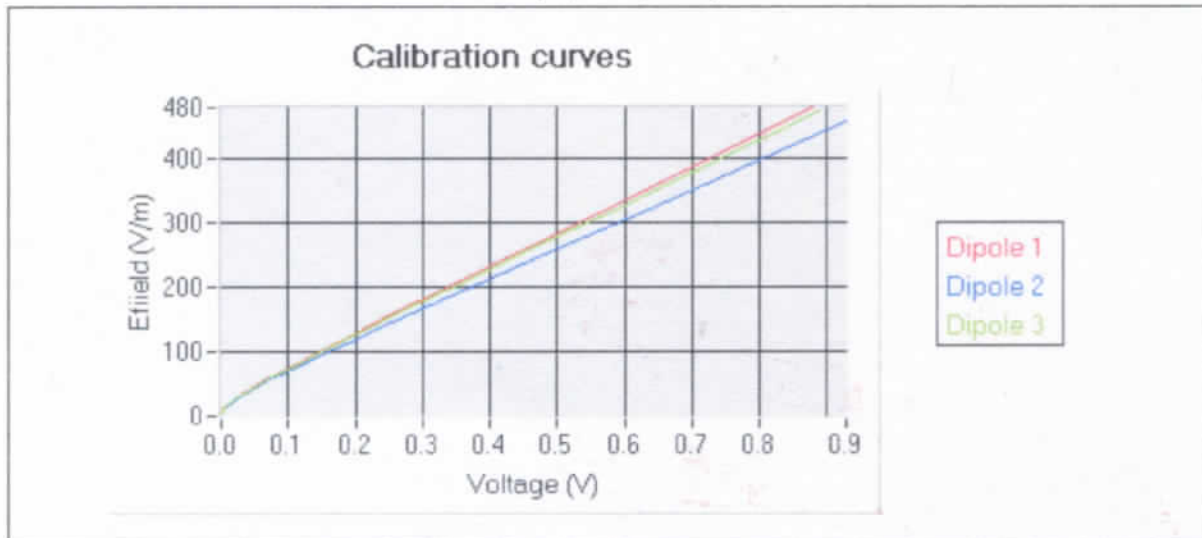
3. Calibration at 897.00 MHz

A. Calibration parameters.

| | |
|---------------------|-----------------------|
| Label | 900 |
| Epsilon | 42.58 |
| Sigma | 0.96 S/m |
| Temperature | 21°C |
| Cable loss | 0.10 dB |
| Coupler loss | 20.27 dB |
| Waveguide S11 | -12.70 dB |
| Low limit detection | 0.82 V/m (0.64 mW/kg) |

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 * E_2^2 * E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 13/26

Issue: A

Date: 2012/12/04

Calibration coefficients for the three dipoles in CW:

| v1 | e1 | v2 | e2 | v3 | e3 |
|-----------|------------|-----------|------------|-----------|------------|
| 0.878810 | 479.977093 | -0.928152 | 459.051477 | 0.886673 | 474.446145 |
| 0.699049 | 387.518511 | -0.752319 | 377.321870 | 0.705070 | 382.994793 |
| 0.562801 | 317.354184 | -0.603602 | 308.110116 | 0.562999 | 311.358915 |
| 0.456625 | 262.582111 | -0.482616 | 251.698142 | 0.450632 | 254.594534 |
| 0.369216 | 217.381022 | -0.386006 | 206.527074 | 0.363798 | 210.611269 |
| 0.293620 | 178.145102 | -0.313396 | 172.446614 | 0.294302 | 175.279111 |
| 0.235810 | 147.981694 | -0.254479 | 144.650728 | 0.237694 | 146.350348 |
| 0.188812 | 123.280907 | -0.205809 | 121.524362 | 0.191549 | 122.597856 |
| 0.151354 | 103.395870 | -0.166238 | 102.537341 | 0.155625 | 103.928232 |
| 0.098881 | 72.556308 | -0.104845 | 72.556308 | 0.100895 | 72.807341 |
| 0.091615 | 69.290736 | -0.098771 | 69.211008 | 0.093599 | 69.530471 |
| 0.082677 | 65.039197 | -0.090592 | 65.039197 | 0.084502 | 65.189128 |
| 0.072569 | 59.934263 | -0.079899 | 59.865301 | 0.074282 | 60.003305 |
| 0.061779 | 53.910725 | -0.068273 | 53.910725 | 0.063236 | 54.035002 |
| 0.050267 | 47.008368 | -0.056037 | 47.116734 | 0.051491 | 47.116734 |
| 0.042568 | 42.283913 | -0.047620 | 42.332622 | 0.043641 | 42.381388 |
| 0.035946 | 38.078092 | -0.040363 | 38.165871 | 0.036889 | 38.165871 |
| 0.030387 | 34.330108 | -0.034169 | 34.409247 | 0.031134 | 34.448885 |
| 0.025582 | 30.986689 | -0.028869 | 31.022384 | 0.026194 | 31.058120 |
| 0.021377 | 27.936705 | -0.024181 | 27.968886 | 0.021863 | 27.968886 |
| 0.017722 | 25.128998 | -0.020091 | 25.128998 | 0.018132 | 25.128998 |
| 0.014528 | 22.447872 | -0.016484 | 22.447872 | 0.014809 | 22.422043 |
| 0.011676 | 19.914765 | -0.013312 | 19.914765 | 0.011901 | 19.891849 |
| 0.009160 | 17.485384 | -0.010469 | 17.485384 | 0.009337 | 17.465265 |
| 0.006717 | 14.797051 | -0.007745 | 14.797051 | 0.006833 | 14.797051 |
| 0.005366 | 13.172711 | -0.006210 | 13.187886 | 0.005458 | 13.172711 |
| 0.004307 | 11.780811 | -0.005039 | 11.794382 | 0.004386 | 11.780811 |
| 0.003482 | 10.560274 | -0.004078 | 10.572439 | 0.003548 | 10.572439 |
| 0.002814 | 9.498940 | -0.003348 | 9.509883 | 0.002876 | 9.509883 |
| 0.002287 | 8.544274 | -0.002732 | 8.554117 | 0.002314 | 8.549179 |
| 0.001835 | 7.676711 | -0.002231 | 7.694408 | 0.001854 | 7.684445 |
| 0.001458 | 6.865548 | -0.001811 | 6.874850 | 0.001467 | 6.873184 |
| 0.001140 | 6.093914 | -0.001448 | 6.110581 | 0.001146 | 6.119211 |
| 0.000870 | 5.359101 | -0.001147 | 5.395359 | 0.000872 | 5.392877 |
| 0.000602 | 4.512924 | -0.000826 | 4.509302 | 0.000594 | 4.538660 |
| 0.000465 | 4.012011 | -0.000681 | 4.045927 | 0.000459 | 4.059514 |
| 0.000363 | 3.594012 | -0.000554 | 3.591290 | 0.000354 | 3.643540 |
| 0.000278 | 3.204293 | -0.000471 | 3.260085 | 0.000265 | 3.249520 |
| 0.000230 | 2.961646 | -0.000401 | 2.952011 | 0.000191 | 2.881168 |
| 0.000170 | 2.627007 | -0.000341 | 2.659695 | 0.000142 | 2.608794 |
| 0.000140 | 2.442555 | -0.000276 | 2.301496 | 0.000097 | 2.330782 |
| 0.000090 | 2.099426 | -0.000248 | 2.128701 | 0.000061 | 2.081811 |
| 0.000056 | 1.829704 | -0.000211 | 1.876111 | 0.000037 | 1.897771 |
| 0.000029 | 1.583109 | -0.000185 | 1.675995 | 0.000008 | 1.648194 |
| 0.000022 | 1.512629 | -0.000157 | 1.429490 | -0.000017 | 1.402573 |
| -0.000009 | 1.149689 | -0.000136 | 1.212149 | -0.000033 | 1.206539 |
| -0.000007 | 1.176489 | -0.000122 | 1.041385 | -0.000047 | 1.024494 |
| -0.000019 | 1.002716 | -0.000112 | 0.900758 | -0.000056 | 0.870486 |
| -0.000028 | 0.852999 | -0.000105 | 0.779999 | -0.000063 | 0.751437 |
| -0.000035 | 0.725064 | -0.000098 | 0.665078 | -0.000067 | 0.642982 |
| -0.000039 | 0.616754 | -0.000094 | 0.573192 | -0.000071 | 0.555219 |
| -0.000043 | 0.525443 | -0.000091 | 0.488881 | -0.000074 | 0.476607 |
| -0.000045 | 0.447692 | | | | |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 14/26

Issue: A

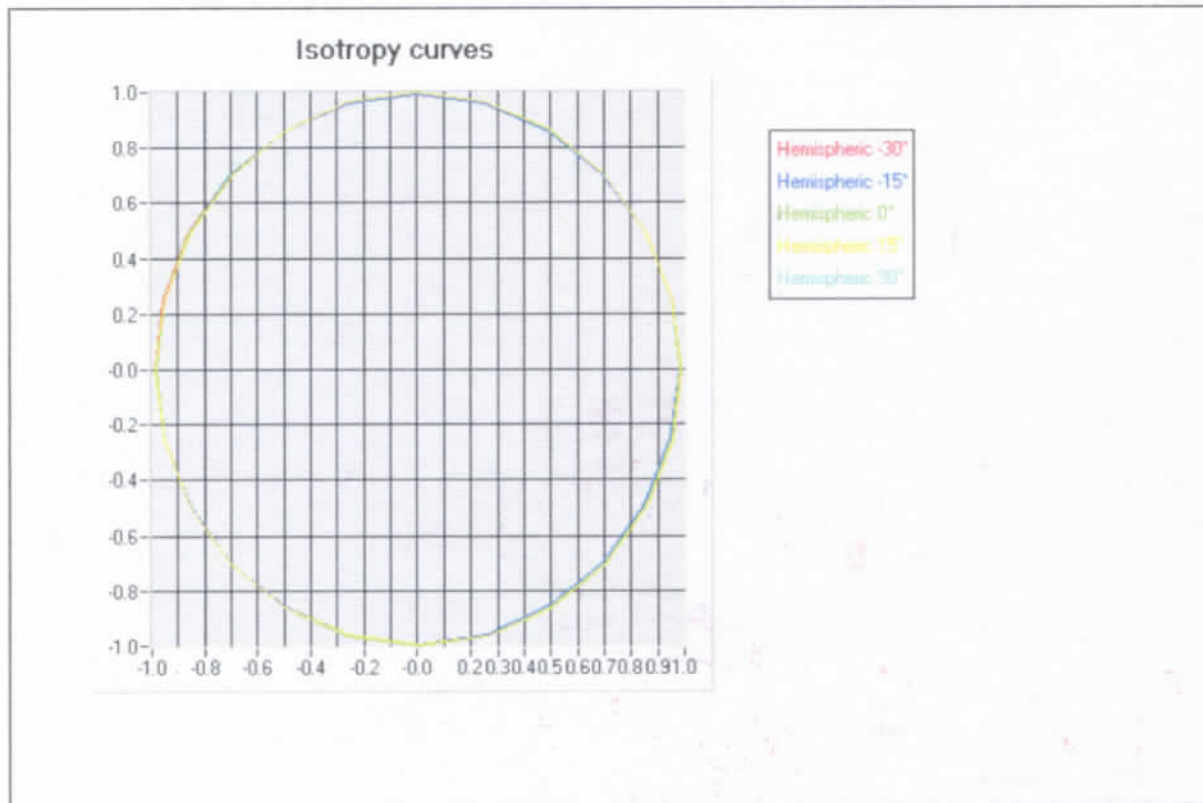
Date: 2012/10/04

Sensitivity in liquid:

| Liquid | ϵ | σ | CF dipole 1 (W.kg^{-1} (mV^{-1})) | CF dipole 2 (W.kg^{-1} (mV^{-1})) | CF dipole 3 (W.kg^{-1} (mV^{-1})) |
|--------|------------|----------|--|--|--|
| Head | 41.50 | 0.97 | 32.062 | 27.383 | 31.065 |
| Body | 56.80 | 1.07 | 32.381 | 27.581 | 31.069 |

B. Isotropy.

- Axial isotropy: 0.04 dB
- Hemispherical isotropy: 0.04 dB



C. Linearity.

- Linearity: 0.08 dB

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 15/26

Issue: A

Date: 2012/10/04

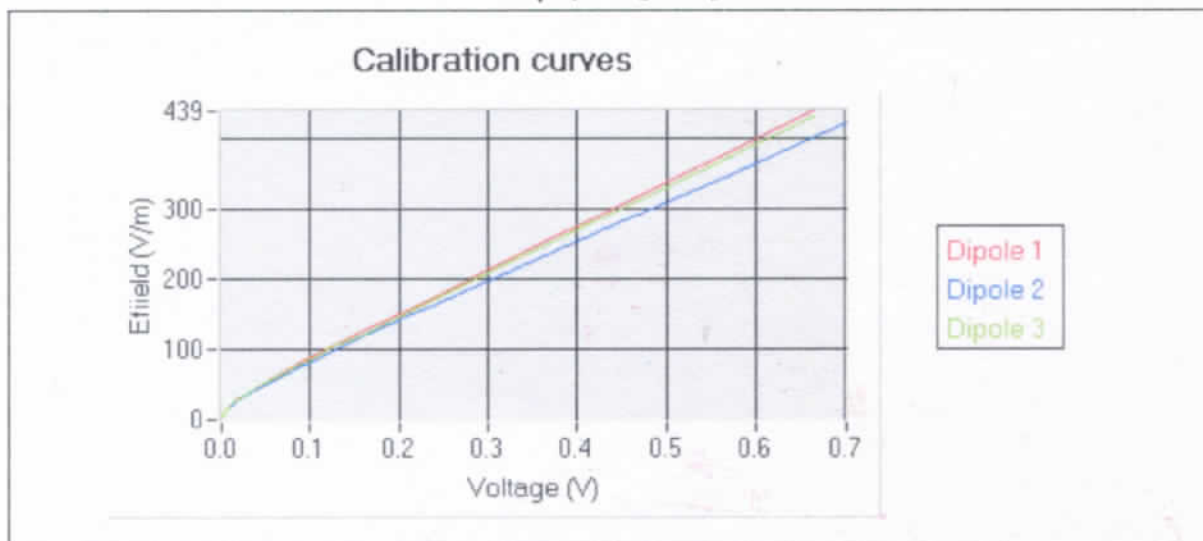
4. Calibration at 1747.00 MHz

A. Calibration parameters.

| | |
|---------------------|-----------------------|
| Label | 1800 |
| Epsilon | 40.09 |
| Sigma | 1.38 S/m |
| Temperature | 21°C |
| Cable loss | 0.14 dB |
| Coupler loss | 20.18 dB |
| Waveguide S11 | -12.70 dB |
| Low limit detection | 0.77 V/m (0.76 mW/kg) |

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 * E_2^2 * E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 16/26

Issue: A

Date: 2012/10/04

Calibration coefficients for the three dipoles in CW:

| v1 | e1 | v2 | e2 | v3 | e3 |
|-----------|------------|-----------|------------|-----------|------------|
| 0.663731 | 438.804880 | -0.701709 | 422.361031 | 0.663453 | 429.853445 |
| 0.539160 | 362.023035 | -0.564539 | 345.724684 | 0.536788 | 353.373332 |
| 0.431901 | 295.807669 | -0.451753 | 282.594309 | 0.426460 | 286.648108 |
| 0.343426 | 241.057307 | -0.364982 | 233.896166 | 0.343134 | 236.130713 |
| 0.219808 | 160.277952 | -0.235390 | 160.277952 | 0.223560 | 160.093531 |
| 0.199960 | 148.892830 | -0.214656 | 149.064347 | 0.203583 | 148.379460 |
| 0.176749 | 135.012440 | -0.190364 | 135.323676 | 0.179925 | 134.701919 |
| 0.153903 | 121.303627 | -0.166397 | 121.583260 | 0.156830 | 121.024636 |
| 0.132690 | 108.236511 | -0.144052 | 108.486023 | 0.135416 | 108.111971 |
| 0.114103 | 96.688269 | -0.124392 | 96.911158 | 0.116620 | 96.577017 |
| 0.098196 | 86.471658 | -0.107364 | 86.670996 | 0.100436 | 86.372161 |
| 0.084369 | 77.512863 | -0.092566 | 77.691549 | 0.086455 | 77.423676 |
| 0.072516 | 69.642408 | -0.079735 | 69.802951 | 0.074359 | 69.562276 |
| 0.062289 | 62.715341 | -0.068695 | 62.787586 | 0.063969 | 62.715341 |
| 0.053507 | 56.542341 | -0.059144 | 56.737969 | 0.055031 | 56.607475 |
| 0.045565 | 50.859699 | -0.050463 | 50.976943 | 0.046806 | 50.801177 |
| 0.036953 | 44.501412 | -0.041052 | 44.603998 | 0.038010 | 44.501412 |
| 0.030069 | 39.162805 | -0.033529 | 39.253084 | 0.030974 | 39.162805 |
| 0.024559 | 34.623724 | -0.027457 | 34.703541 | 0.025331 | 34.663610 |
| 0.020114 | 30.822921 | -0.022570 | 30.893975 | 0.020790 | 30.822921 |
| 0.016497 | 27.502602 | -0.018554 | 27.566001 | 0.017063 | 27.534284 |
| 0.013562 | 24.624860 | -0.015276 | 24.681628 | 0.014044 | 24.653228 |
| 0.011154 | 22.124516 | -0.012611 | 22.175519 | 0.011567 | 22.150003 |
| 0.009196 | 19.923873 | -0.010407 | 19.969804 | 0.009549 | 19.969804 |
| 0.007595 | 17.983483 | -0.008614 | 18.024938 | 0.007887 | 18.024938 |
| 0.006237 | 16.194732 | -0.007082 | 16.232065 | 0.006466 | 16.213389 |
| 0.004819 | 14.153825 | -0.005485 | 14.186452 | 0.004999 | 14.186452 |
| 0.003758 | 12.470210 | -0.004301 | 12.484575 | 0.003902 | 12.470210 |
| 0.002958 | 11.024878 | -0.003393 | 11.050293 | 0.003070 | 11.037578 |
| 0.002353 | 9.803334 | -0.002699 | 9.825932 | 0.002439 | 9.814627 |
| 0.001870 | 8.747294 | -0.002168 | 8.757373 | 0.001956 | 8.767460 |
| 0.001499 | 7.841042 | -0.001746 | 7.850074 | 0.001564 | 7.859117 |
| 0.001206 | 7.036777 | -0.001411 | 7.052998 | 0.001257 | 7.061124 |
| 0.000974 | 6.336855 | -0.001152 | 6.358779 | 0.001020 | 6.366104 |
| 0.000795 | 5.726296 | -0.000949 | 5.739497 | 0.000830 | 5.739497 |
| 0.000619 | 5.052889 | -0.000742 | 5.050958 | 0.000640 | 5.050958 |
| 0.000461 | 4.393269 | -0.000572 | 4.414421 | 0.000483 | 4.424549 |
| 0.000356 | 3.893589 | -0.000447 | 3.916767 | 0.000370 | 3.896823 |
| 0.000272 | 3.442008 | -0.000345 | 3.420826 | 0.000287 | 3.458278 |
| 0.000212 | 3.079166 | -0.000284 | 3.086385 | 0.000223 | 3.077746 |
| 0.000171 | 2.804352 | -0.000237 | 2.801601 | 0.000174 | 2.751051 |
| 0.000125 | 2.459743 | -0.000185 | 2.448220 | 0.000141 | 2.507157 |
| 0.000097 | 2.223990 | -0.000164 | 2.290103 | 0.000108 | 2.236826 |
| 0.000078 | 2.048621 | -0.000135 | 2.051816 | 0.000085 | 2.027207 |
| 0.000057 | 1.835400 | -0.000102 | 1.741442 | 0.000065 | 1.825466 |
| 0.000043 | 1.678270 | -0.000098 | 1.699975 | 0.000053 | 1.692922 |
| 0.000027 | 1.478382 | -0.000082 | 1.522855 | 0.000041 | 1.549077 |
| 0.000017 | 1.338378 | -0.000066 | 1.322219 | 0.000023 | 1.303888 |
| 0.000005 | 1.148052 | -0.000054 | 1.148974 | 0.000015 | 1.178656 |
| 0.000002 | 1.095316 | -0.000049 | 1.068531 | 0.000011 | 1.110757 |
| -0.000006 | 0.937825 | -0.000043 | 0.963171 | 0.000002 | 0.940225 |
| -0.000012 | 0.811741 | -0.000036 | 0.823385 | -0.000004 | 0.809110 |
| -0.000016 | 0.698282 | -0.000031 | 0.712959 | -0.000008 | 0.697060 |
| -0.000019 | 0.597362 | -0.000027 | 0.605013 | -0.000012 | 0.596303 |
| -0.000022 | 0.508555 | -0.000025 | 0.523033 | -0.000014 | 0.515459 |
| -0.000024 | 0.437175 | -0.000023 | 0.450836 | -0.000016 | 0.443307 |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 17/26

Issue: A

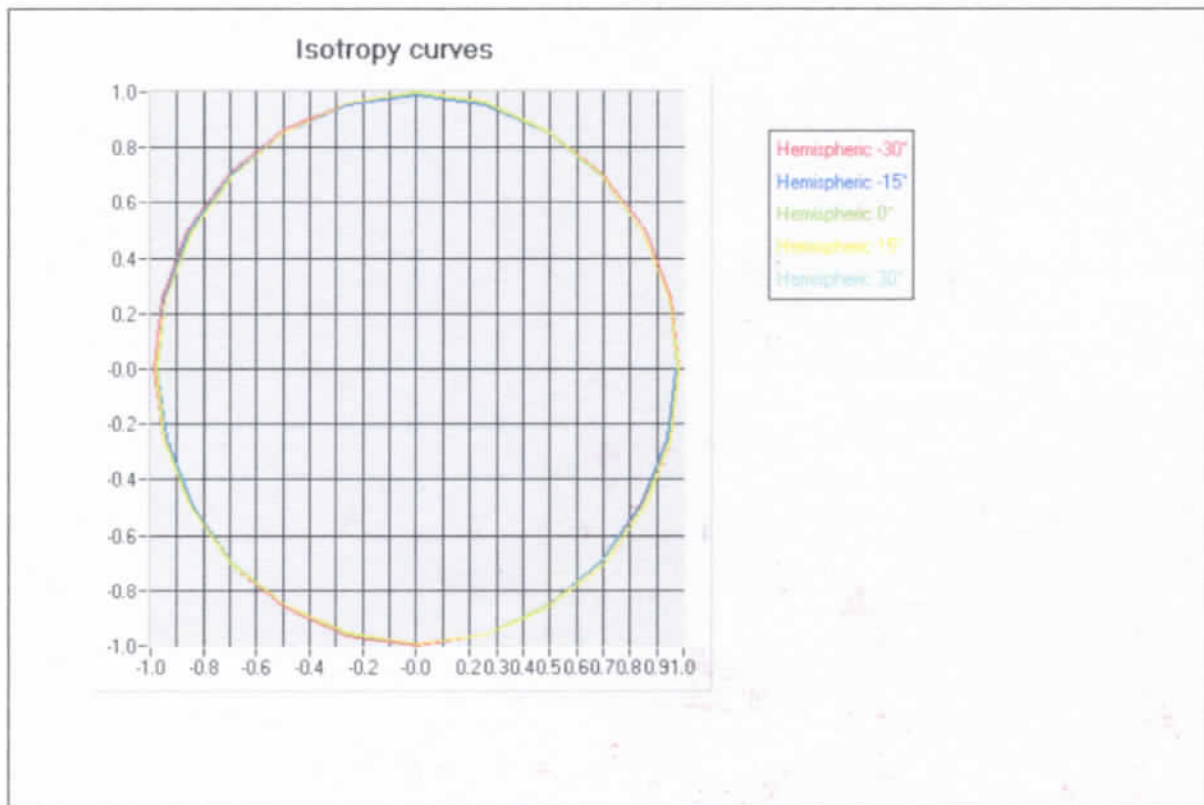
Date: 2012/10/04

Sensitivity in liquid:

| Liquid | ϵ | σ | CF dipole 1 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 2 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 3 (W.kg^{-1} (mV^{-1}) ⁻¹) |
|--------|------------|----------|---|---|---|
| Head | 42.00 | 1.40 | 42.533 | 36.791 | 41.019 |
| Body | 54.00 | 1.45 | 42.982 | 37.514 | 41.835 |

B. Isotropy.

- Axial isotropy: 0.05 dB
- Hemispherical isotropy: 0.06 dB



C. Linearity.

- Linearity: 0.08 dB

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 18/26

Issue: A

Date: 2012/10/4

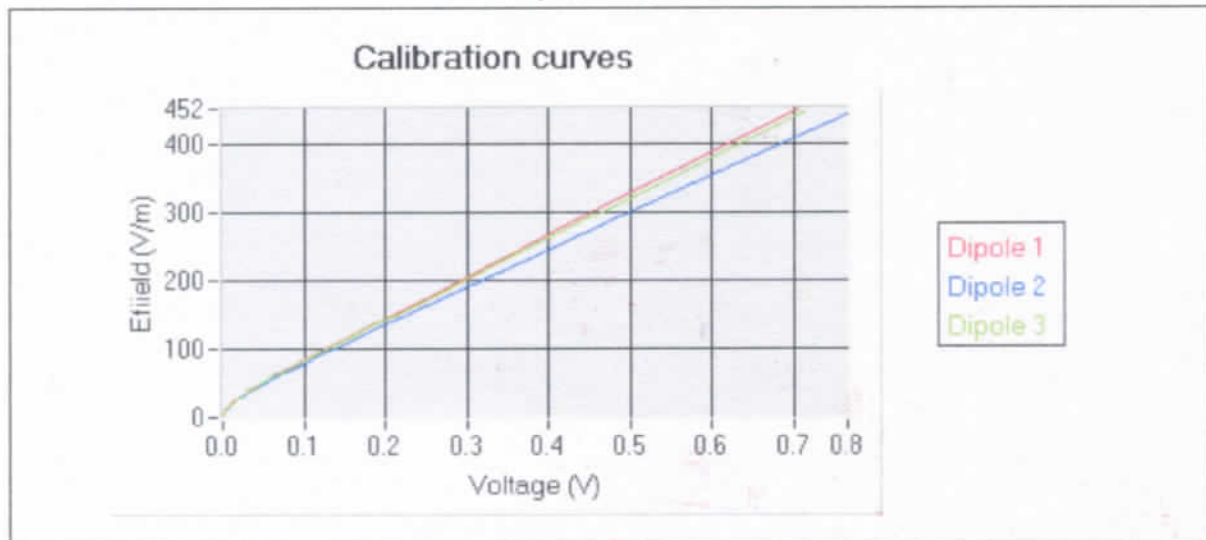
5. Calibration at 1880.00 MHz

A. Calibration parameters.

| | |
|---------------------|-----------------------|
| Label | 1900 |
| Epsilon | 39.68 |
| Sigma | 1.39 S/m |
| Temperature | 21°C |
| Cable loss | 0.15 dB |
| Coupler loss | 20.12 dB |
| Waveguide S11 | -32.10 dB |
| Low limit detection | 0.82 V/m (0.93 mW/kg) |

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 * E_2^2 * E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 19/26

Issue: A

Date: 2012/10/04

Calibration coefficients for the three dipoles in CW:

| v1 | e1 | v2 | e2 | v3 | e3 |
|-----------|------------|-----------|------------|-----------|------------|
| 0.705687 | 452.433469 | -0.764862 | 444.880127 | 0.711360 | 446.684059 |
| 0.563683 | 367.171675 | -0.608616 | 360.024001 | 0.572685 | 365.129747 |
| 0.452345 | 300.224376 | -0.487470 | 294.121999 | 0.454781 | 295.690095 |
| 0.364839 | 247.497983 | -0.395865 | 244.176010 | 0.366095 | 243.346556 |
| 0.233395 | 163.656692 | -0.249573 | 163.656692 | 0.237445 | 163.656692 |
| 0.215075 | 153.261745 | -0.230502 | 153.438296 | 0.219204 | 153.261745 |
| 0.191763 | 139.937390 | -0.206083 | 140.098591 | 0.195785 | 140.098591 |
| 0.167877 | 125.873344 | -0.180901 | 126.163511 | 0.171664 | 126.308846 |
| 0.145753 | 112.832385 | -0.157556 | 113.092489 | 0.149292 | 113.222768 |
| 0.126236 | 101.142520 | -0.136873 | 101.259030 | 0.129435 | 101.492457 |
| 0.108989 | 90.559448 | -0.118604 | 90.663768 | 0.111932 | 90.872769 |
| 0.094057 | 81.177144 | -0.102669 | 81.364277 | 0.096737 | 81.551841 |
| 0.080982 | 72.934627 | -0.088705 | 73.102759 | 0.083414 | 73.271278 |
| 0.069714 | 65.604521 | -0.076562 | 65.755754 | 0.071914 | 65.907337 |
| 0.059985 | 59.215277 | -0.066067 | 59.351782 | 0.061926 | 59.488602 |
| 0.051909 | 53.756844 | -0.057334 | 53.880767 | 0.053598 | 53.942835 |
| 0.042215 | 46.982246 | -0.046814 | 47.036367 | 0.043656 | 47.144797 |
| 0.034444 | 41.298451 | -0.038327 | 41.393653 | 0.035678 | 41.441338 |
| 0.028208 | 36.511843 | -0.031481 | 36.596012 | 0.029255 | 36.638170 |
| 0.023204 | 32.466372 | -0.025945 | 32.541214 | 0.024075 | 32.616231 |
| 0.019074 | 28.969017 | -0.021384 | 29.035797 | 0.019810 | 29.102733 |
| 0.015712 | 25.937838 | -0.017664 | 25.997630 | 0.016340 | 26.057561 |
| 0.012954 | 23.304177 | -0.014597 | 23.357899 | 0.013487 | 23.384805 |
| 0.010696 | 20.962051 | -0.012072 | 21.010373 | 0.011146 | 21.058807 |
| 0.008846 | 18.920550 | -0.010001 | 18.964167 | 0.009222 | 19.007884 |
| 0.007320 | 17.117241 | -0.008280 | 17.136959 | 0.007622 | 17.156700 |
| 0.005669 | 14.942861 | -0.006432 | 14.977308 | 0.005902 | 14.994562 |
| 0.004418 | 13.135112 | -0.005030 | 13.165392 | 0.004607 | 13.180557 |
| 0.003480 | 11.612714 | -0.003970 | 11.639485 | 0.003632 | 11.666316 |
| 0.002760 | 10.337935 | -0.003165 | 10.349843 | 0.002885 | 10.361766 |
| 0.002209 | 9.213693 | -0.002527 | 9.234933 | 0.002300 | 9.256223 |
| 0.001769 | 8.249616 | -0.002042 | 8.268634 | 0.001851 | 8.278160 |
| 0.001425 | 7.411972 | -0.001657 | 7.420510 | 0.001492 | 7.437617 |
| 0.001154 | 6.667051 | -0.001350 | 6.682420 | 0.001208 | 6.697825 |
| 0.000934 | 6.017745 | -0.001105 | 6.031617 | 0.000980 | 6.035436 |
| 0.000716 | 5.271494 | -0.000849 | 5.265501 | 0.000745 | 5.279016 |
| 0.000539 | 4.606218 | -0.000654 | 4.609655 | 0.000566 | 4.620497 |
| 0.000413 | 4.059511 | -0.000512 | 4.066035 | 0.000437 | 4.080555 |
| 0.000317 | 3.587480 | -0.000405 | 3.602614 | 0.000335 | 3.596690 |
| 0.000249 | 3.211417 | -0.000324 | 3.207578 | 0.000271 | 3.256587 |
| 0.000199 | 2.903996 | -0.000268 | 2.903208 | 0.000212 | 2.908029 |
| 0.000152 | 2.581857 | -0.000216 | 2.588731 | 0.000157 | 2.540391 |
| 0.000121 | 2.345289 | -0.000176 | 2.317973 | 0.000133 | 2.362102 |
| 0.000090 | 2.082012 | -0.000151 | 2.131354 | 0.000100 | 2.092295 |
| 0.000072 | 1.912583 | -0.000126 | 1.926743 | 0.000083 | 1.938704 |
| 0.000055 | 1.737461 | -0.000107 | 1.755360 | 0.000061 | 1.719695 |
| 0.000036 | 1.518014 | -0.000084 | 1.522296 | 0.000046 | 1.552761 |
| 0.000025 | 1.375051 | -0.000073 | 1.397154 | 0.000030 | 1.352169 |
| 0.000010 | 1.151852 | -0.000060 | 1.232991 | 0.000019 | 1.194885 |
| 0.000009 | 1.135413 | -0.000046 | 1.027269 | 0.000009 | 1.028022 |
| 0.000003 | 1.031291 | -0.000037 | 0.872937 | 0.000001 | 0.874876 |
| -0.000005 | 0.880469 | -0.000031 | 0.752345 | -0.000005 | 0.749785 |
| -0.000010 | 0.760355 | -0.000027 | 0.645069 | -0.000009 | 0.639312 |
| -0.000014 | 0.651604 | -0.000023 | 0.551655 | -0.000012 | 0.551888 |
| -0.000017 | 0.554581 | -0.000021 | 0.468256 | -0.000014 | 0.473314 |
| -0.000019 | 0.478585 | | | | |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 20/26

Issue: A

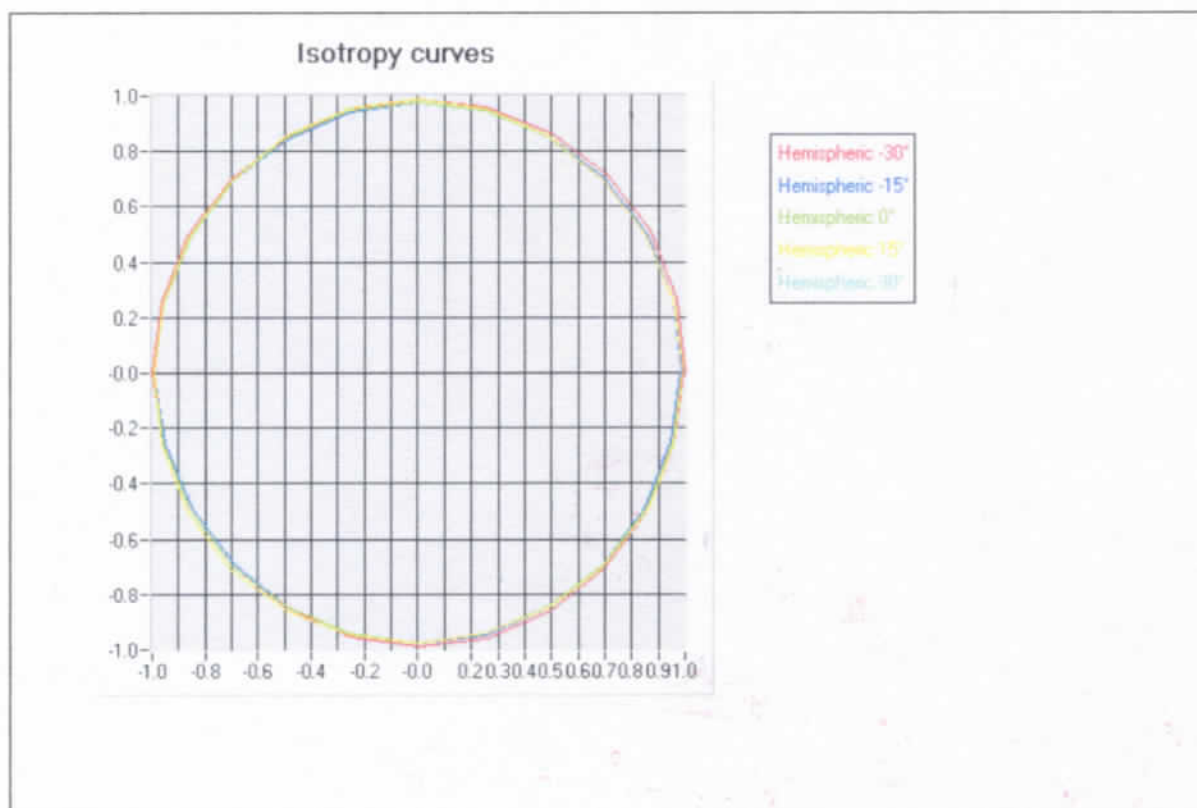
Date: 2012/10/04

Sensitivity in liquid:

| Liquid | ϵ | σ | CF dipole 1 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 2 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 3 (W.kg^{-1} (mV^{-1}) ⁻¹) |
|--------|------------|----------|---|---|---|
| Head | 42.00 | 1.40 | 40.136 | 34.843 | 38.721 |
| Body | 54.00 | 1.45 | 40.625 | 34.773 | 38.535 |

B. Isotropy.

- Axial isotropy: 0.06 dB
- Hemispherical isotropy: 0.07 dB



C. Linearity.

- Linearity: 0.12 dB

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 21/26

Issue: A

Date: 2012/10/04

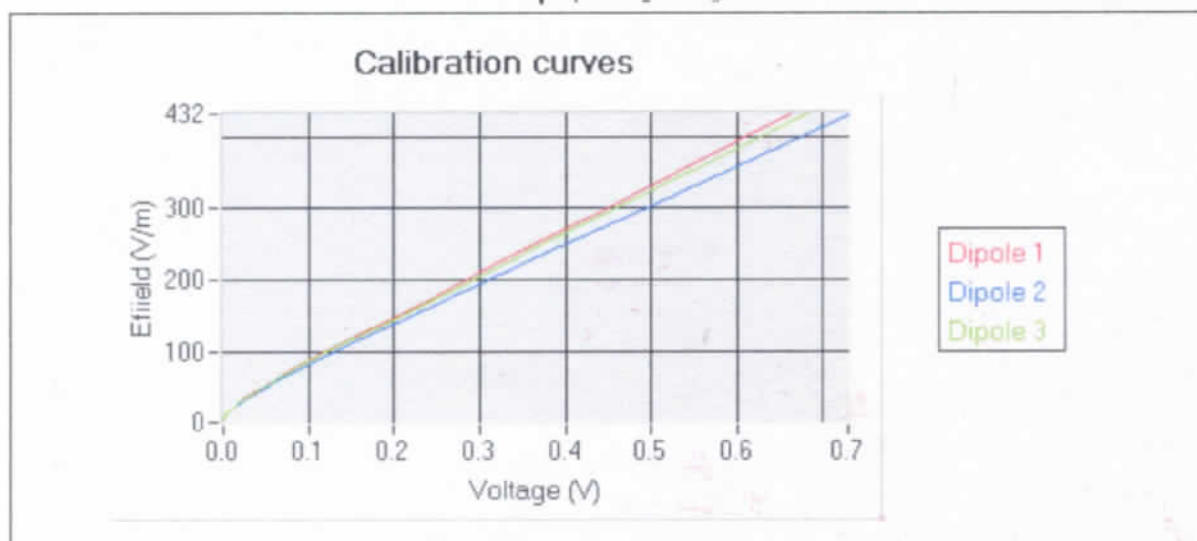
6. Calibration at 1950.00 MHz

A. Calibration parameters.

| | |
|---------------------|-----------------------|
| Label | 2000 |
| Epsilon | 39.69 |
| Sigma | 1.44 S/m |
| Temperature | 21°C |
| Cable loss | 0.14 dB |
| Coupler loss | 20.12 dB |
| Waveguide S11 | -31.20 dB |
| Low limit detection | 0.79 V/m (0.89 mW/kg) |

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 * E_2^2 * E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 22/26

Issue: A

Date: 2012/10/04

Calibration coefficients for the three dipoles in CW:

| v1 | e1 | v2 | e2 | v3 | e3 |
|-----------|------------|-----------|------------|-----------|------------|
| 0.661947 | 431.378356 | -0.728866 | 429.451431 | 0.681969 | 432.242640 |
| 0.528785 | 350.395683 | -0.580429 | 348.089093 | 0.548843 | 353.466289 |
| 0.423011 | 285.964354 | -0.461683 | 282.880864 | 0.436057 | 286.620025 |
| 0.338877 | 234.593477 | -0.370019 | 232.409000 | 0.351179 | 236.196574 |
| 0.222899 | 159.936072 | -0.239382 | 159.752045 | 0.227301 | 159.936072 |
| 0.199714 | 146.536706 | -0.214934 | 146.368096 | 0.203996 | 146.536706 |
| 0.173676 | 131.052837 | -0.187341 | 131.203804 | 0.177783 | 131.354944 |
| 0.149407 | 116.666568 | -0.161622 | 116.666568 | 0.153166 | 116.935513 |
| 0.127916 | 103.501448 | -0.138841 | 103.620677 | 0.131334 | 103.740044 |
| 0.109450 | 92.033603 | -0.119179 | 92.245763 | 0.112533 | 92.352025 |
| 0.093698 | 82.025035 | -0.102267 | 82.214122 | 0.096429 | 82.308830 |
| 0.080261 | 73.442327 | -0.087875 | 73.526929 | 0.082737 | 73.611628 |
| 0.068722 | 65.833421 | -0.075460 | 65.909259 | 0.070899 | 65.985183 |
| 0.058889 | 59.148866 | -0.064861 | 59.285219 | 0.060789 | 59.353513 |
| 0.050483 | 53.326911 | -0.055737 | 53.449842 | 0.052146 | 53.573057 |
| 0.043169 | 48.188835 | -0.047771 | 48.244346 | 0.044590 | 48.244346 |
| 0.034915 | 42.067473 | -0.038773 | 42.164449 | 0.036094 | 42.164449 |
| 0.028320 | 36.978256 | -0.031538 | 37.020853 | 0.029302 | 37.063499 |
| 0.023047 | 32.692372 | -0.025741 | 32.730031 | 0.023873 | 32.767735 |
| 0.018835 | 29.070093 | -0.021098 | 29.103581 | 0.019526 | 29.137107 |
| 0.015403 | 25.908747 | -0.017291 | 25.968474 | 0.015986 | 25.998389 |
| 0.012633 | 23.197780 | -0.014207 | 23.251256 | 0.013114 | 23.278041 |
| 0.010363 | 20.842337 | -0.011685 | 20.866346 | 0.010777 | 20.890384 |
| 0.008536 | 18.747633 | -0.009633 | 18.790850 | 0.008871 | 18.812496 |
| 0.007026 | 16.921794 | -0.007949 | 16.941288 | 0.007315 | 16.960804 |
| 0.005944 | 15.486255 | -0.006726 | 15.504096 | 0.006179 | 15.521955 |
| 0.004583 | 13.534632 | -0.005194 | 13.550222 | 0.004768 | 13.565833 |
| 0.003563 | 11.883556 | -0.004053 | 11.897245 | 0.003715 | 11.910951 |
| 0.002797 | 10.506219 | -0.003195 | 10.518321 | 0.002915 | 10.530438 |
| 0.002218 | 9.331392 | -0.002543 | 9.352903 | 0.002312 | 9.363676 |
| 0.001764 | 8.326192 | -0.002030 | 8.335784 | 0.001837 | 8.355000 |
| 0.001416 | 7.454979 | -0.001638 | 7.472164 | 0.001472 | 7.472164 |
| 0.001131 | 6.690313 | -0.001320 | 6.698020 | 0.001198 | 6.705736 |
| 0.000915 | 6.017920 | -0.001077 | 6.031794 | 0.000960 | 6.038741 |
| 0.000741 | 5.425583 | -0.000885 | 5.444355 | 0.000783 | 5.450626 |
| 0.000565 | 4.763722 | -0.000684 | 4.769210 | 0.000588 | 4.754705 |
| 0.000426 | 4.161853 | -0.000527 | 4.177788 | 0.000448 | 4.170438 |
| 0.000324 | 3.660725 | -0.000407 | 3.668144 | 0.000344 | 3.676792 |
| 0.000254 | 3.272711 | -0.000330 | 3.276639 | 0.000278 | 3.325727 |
| 0.000190 | 2.872448 | -0.000263 | 2.907182 | 0.000218 | 2.970792 |
| 0.000158 | 2.649739 | -0.000216 | 2.617066 | 0.000165 | 2.617533 |
| 0.000126 | 2.406508 | -0.000180 | 2.370960 | 0.000125 | 2.315507 |
| 0.000089 | 2.090282 | -0.000141 | 2.071612 | 0.000103 | 2.131227 |
| 0.000070 | 1.907632 | -0.000125 | 1.935455 | 0.000073 | 1.850594 |
| 0.000052 | 1.716763 | -0.000105 | 1.750428 | 0.000063 | 1.747061 |
| 0.000040 | 1.576733 | -0.000087 | 1.565314 | 0.000050 | 1.602499 |
| 0.000019 | 1.295764 | -0.000068 | 1.342505 | 0.000027 | 1.308170 |
| 0.000012 | 1.187425 | -0.000062 | 1.264011 | 0.000024 | 1.264739 |
| 0.000006 | 1.085994 | -0.000052 | 1.121039 | 0.000017 | 1.157079 |
| 0.000002 | 1.012745 | -0.000044 | 0.991934 | 0.000004 | 0.924453 |
| 0.000000 | 0.974057 | -0.000044 | 0.991934 | -0.000002 | 0.792898 |
| -0.000006 | 0.841386 | -0.000033 | 0.780282 | -0.000006 | 0.682531 |
| -0.000011 | 0.721397 | -0.000031 | 0.735283 | -0.000010 | 0.590964 |
| -0.000015 | 0.616765 | -0.000027 | 0.630434 | -0.000012 | 0.501475 |
| -0.000017 | 0.529958 | -0.000024 | 0.544930 | -0.000014 | 0.431758 |
| -0.000019 | 0.458647 | -0.000022 | 0.469734 | | |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 23/26

Issue: A

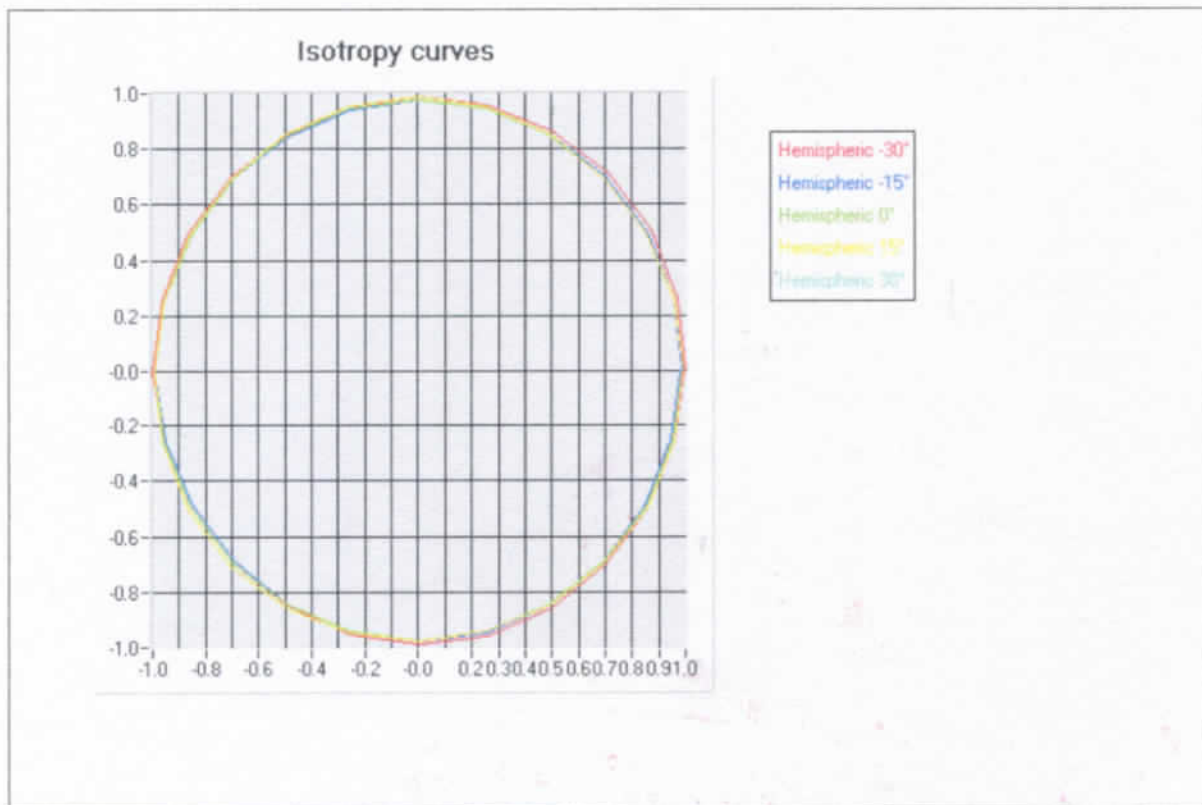
Date: 2012/10/04

Sensitivity in liquid:

| Liquid | ϵ | σ | CF dipole 1 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 2 (W.kg^{-1} (mV^{-1}) ⁻¹) | CF dipole 3 (W.kg^{-1} (mV^{-1}) ⁻¹) |
|--------|------------|----------|---|---|---|
| Head | 42.00 | 1.40 | 40.977 | 35.416 | 39.388 |
| Body | 54.00 | 1.45 | 41.326 | 36.005 | 40.117 |

B. Isotropy.

- Axial isotropy: 0.06 dB
- Hemispherical isotropy: 0.07 dB



C. Linearity.

- Linearity: 0.13 dB

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 24/26

Issue: A

Date: 2012/10/04

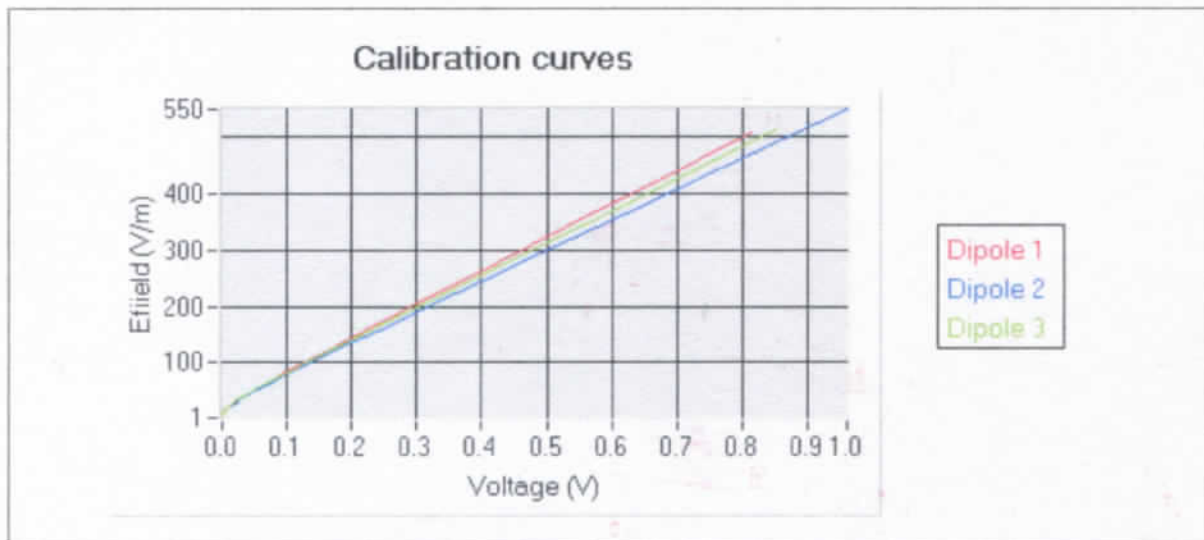
7. Calibration at 2450.00 MHz

A. Calibration parameters.

| | |
|---------------------|-----------------------|
| Label | 2450 |
| Epsilon | 37.93 |
| Sigma | 1.89 S/m |
| Temperature | 21°C |
| Cable loss | 0.13 dB |
| Coupler loss | 21.51 dB |
| Waveguide S11 | -13.20 dB |
| Low limit detection | 0.92 V/m (1.58 mW/kg) |

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 * E_2^2 * E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 25/26

Issue: A

Date: 2012/10/04

Calibration coefficients for the three dipoles in CW:

| v1 | e1 | v2 | e2 | v3 | e3 |
|-----------|------------|-----------|------------|-----------|------------|
| 0.811011 | 506.364572 | -0.960250 | 549.576775 | 0.852378 | 513.168901 |
| 0.654685 | 414.338278 | -0.765658 | 443.865967 | 0.690132 | 421.007684 |
| 0.527958 | 339.653217 | -0.620567 | 364.975082 | 0.555542 | 344.472882 |
| 0.426242 | 279.610707 | -0.492754 | 295.384135 | 0.448357 | 283.424871 |
| 0.343625 | 230.727305 | -0.399627 | 244.577703 | 0.360025 | 232.997679 |
| 0.272758 | 188.648406 | -0.320299 | 201.177838 | 0.289397 | 192.540954 |
| 0.219562 | 156.902806 | -0.255170 | 165.396787 | 0.231016 | 158.937231 |
| 0.175415 | 130.373321 | -0.205220 | 137.792360 | 0.187773 | 133.881325 |
| 0.141416 | 109.746862 | -0.163038 | 114.288007 | 0.151432 | 112.638859 |
| 0.114684 | 93.328263 | -0.131858 | 96.719904 | 0.122274 | 95.390988 |
| 0.092577 | 79.531494 | -0.106512 | 82.235294 | 0.098545 | 81.132443 |
| 0.074356 | 67.920300 | -0.084551 | 69.442209 | 0.078767 | 69.000273 |
| 0.059797 | 58.393153 | -0.068505 | 59.864104 | 0.063888 | 59.636096 |
| 0.048340 | 50.651528 | -0.054651 | 51.344452 | 0.051593 | 51.656619 |
| 0.038647 | 43.841849 | -0.043800 | 44.418369 | 0.041113 | 44.588164 |
| 0.031040 | 38.242197 | -0.035080 | 38.602454 | 0.033393 | 39.142320 |
| 0.024879 | 33.458730 | -0.028075 | 33.684563 | 0.026560 | 34.065375 |
| 0.020174 | 29.583828 | -0.022652 | 29.652906 | 0.021545 | 30.111874 |
| 0.012901 | 22.966984 | -0.014603 | 23.072995 | 0.013652 | 23.232931 |
| 0.011713 | 21.782313 | -0.013215 | 21.807405 | 0.012179 | 21.832526 |
| 0.009144 | 19.037240 | -0.010337 | 19.081125 | 0.009516 | 19.081125 |
| 0.007180 | 16.734163 | -0.008138 | 16.753440 | 0.007467 | 16.772738 |
| 0.005669 | 14.777602 | -0.006448 | 14.811669 | 0.005904 | 14.811669 |
| 0.004512 | 13.125141 | -0.005148 | 13.155398 | 0.004710 | 13.155398 |
| 0.003623 | 11.711270 | -0.004135 | 11.724760 | 0.003775 | 11.738267 |
| 0.002917 | 10.473792 | -0.003340 | 10.497939 | 0.003038 | 10.510032 |
| 0.002366 | 9.410312 | -0.002706 | 9.421152 | 0.002464 | 9.421152 |
| 0.001911 | 8.464552 | -0.002207 | 8.484065 | 0.001997 | 8.484065 |
| 0.001554 | 7.640188 | -0.001806 | 7.648988 | 0.001630 | 7.657799 |
| 0.001292 | 6.949638 | -0.001507 | 6.975959 | 0.001346 | 6.975959 |
| 0.000981 | 6.073873 | -0.001152 | 6.089814 | 0.001035 | 6.096828 |
| 0.000753 | 5.341375 | -0.000898 | 5.359250 | 0.000788 | 5.353082 |
| 0.000591 | 4.752804 | -0.000705 | 4.727200 | 0.000617 | 4.732646 |
| 0.000455 | 4.195415 | -0.000560 | 4.209852 | 0.000485 | 4.193764 |
| 0.000359 | 3.752442 | -0.000450 | 3.761341 | 0.000376 | 3.750627 |
| 0.000282 | 3.355136 | -0.000357 | 3.335421 | 0.000296 | 3.358180 |
| 0.000222 | 3.009404 | -0.000295 | 3.018267 | 0.000240 | 3.042913 |
| 0.000184 | 2.768196 | -0.000241 | 2.711983 | 0.000186 | 2.707184 |
| 0.000144 | 2.489167 | -0.000206 | 2.493450 | 0.000153 | 2.479740 |
| 0.000113 | 2.249238 | -0.000171 | 2.253828 | 0.000121 | 2.237214 |
| 0.000080 | 1.961844 | -0.000142 | 2.034010 | 0.000097 | 2.036452 |
| 0.000052 | 1.679871 | -0.000108 | 1.741305 | 0.000063 | 1.712208 |
| 0.000040 | 1.543335 | -0.000088 | 1.543409 | 0.000045 | 1.512668 |
| 0.000026 | 1.366913 | -0.000075 | 1.399853 | 0.000036 | 1.402290 |
| 0.000012 | 1.169294 | -0.000066 | 1.291153 | 0.000023 | 1.225427 |
| 0.000003 | 1.010080 | -0.000056 | 1.158473 | 0.000017 | 1.134538 |
| -0.000005 | 0.857979 | -0.000046 | 1.008485 | 0.000011 | 1.035703 |
| -0.000010 | 0.733105 | -0.000045 | 0.992241 | 0.000008 | 0.982563 |
| -0.000014 | 0.623382 | -0.000037 | 0.854719 | 0.000005 | 0.926381 |
| -0.000017 | 0.530190 | -0.000031 | 0.734132 | 0.000005 | 0.926381 |
| | | -0.000027 | 0.633745 | -0.000001 | 0.802299 |
| | | -0.000024 | 0.541792 | -0.000006 | 0.686256 |
| | | | | -0.000009 | 0.593698 |
| | | | | -0.000012 | 0.512925 |

COMOSAR E-Field probe Calibration Report



Ref: CR-280-1-08-SATB-A

Page: 26/26

Issue: A

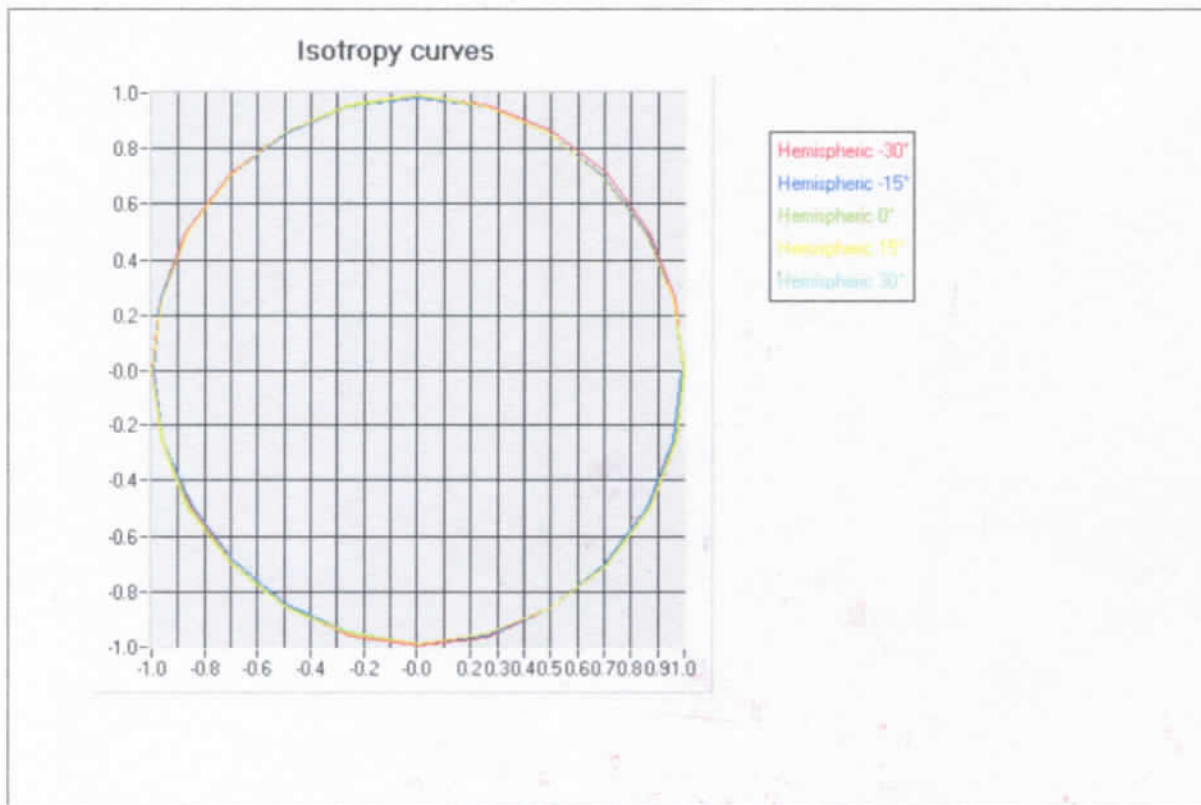
Date: 2012/10/04

Sensitivity in liquid:

| Liquid | ϵ | σ | CF dipole 1 ($W.kg^{-1}$ (mV) $^{-1}$) | CF dipole 2 ($W.kg^{-1}$ (mV) $^{-1}$) | CF dipole 3 ($W.kg^{-1}$ (mV) $^{-1}$) |
|--------|------------|----------|--|--|--|
| Head | 39.20 | 1.80 | 39.563 | 33.614 | 37.677 |
| Body | 52.50 | 1.78 | 39.772 | 33.946 | 37.835 |

B. Isotropy.

- Axial isotropy: 0.06 dB
- Hemispherical isotropy: 0.06 dB



C. Linearity.

- Linearity: 0.13 dB