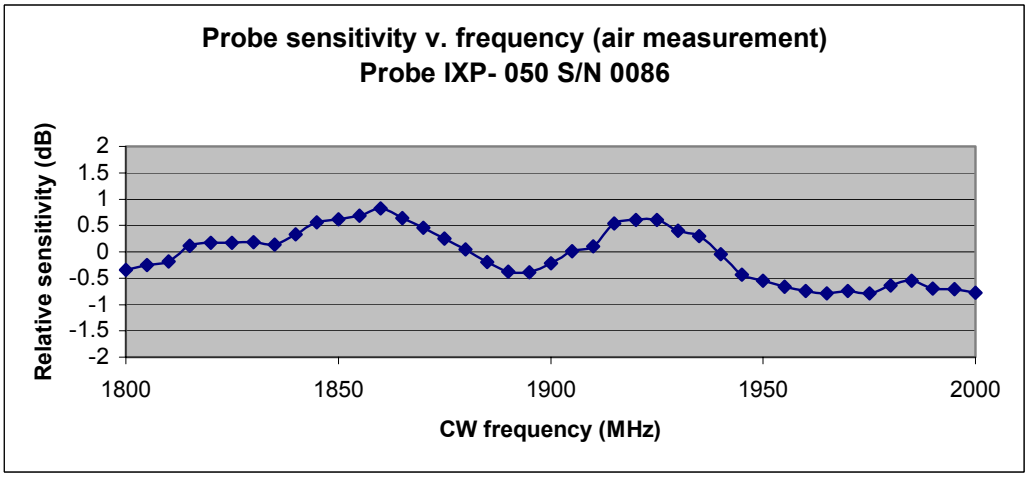
Item 6) Use of 1800MHz probe calibration at 1900 MHz.

Measurements on a probe representative of the IXP-050 probes as supplied to Met Labs indicates that the probe sensitivity varies with frequency as shown below:



Whilst the measurements indicate a variation of 1.6dB over the range 1800 to 2000MHz, the response at 1800 and 1at 1900MHz is very similar. This is borne out for probes calibrated in liquid at both 1800MHz and 1900MHz, where the probe calibration factors are similar.

Probe liquid calibration factors for this probe are compared for different frequencies in the Table below:

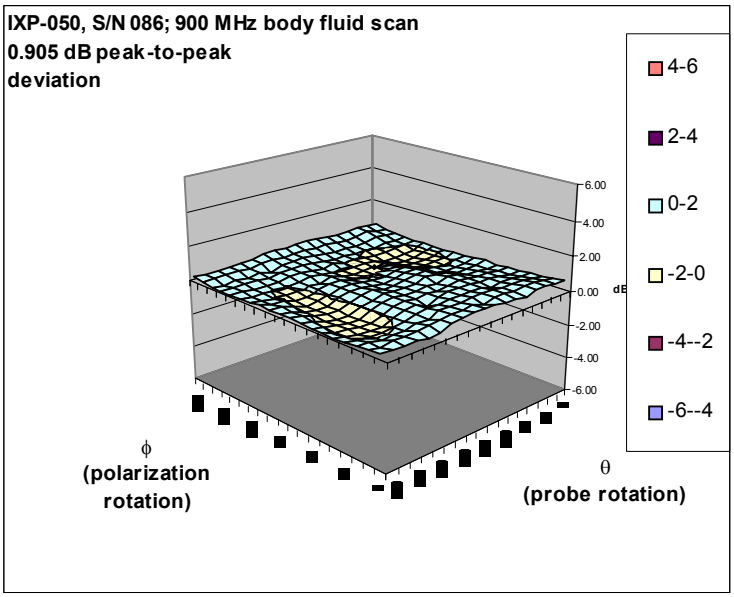
Frequency (MHz)	X factor	Y factor	Z factor
900	0.320	0.325	0.310
1800	0.406	0.392	0.434
1900	0.412	0.426	0.399
2450	0.593	0.571	0.633

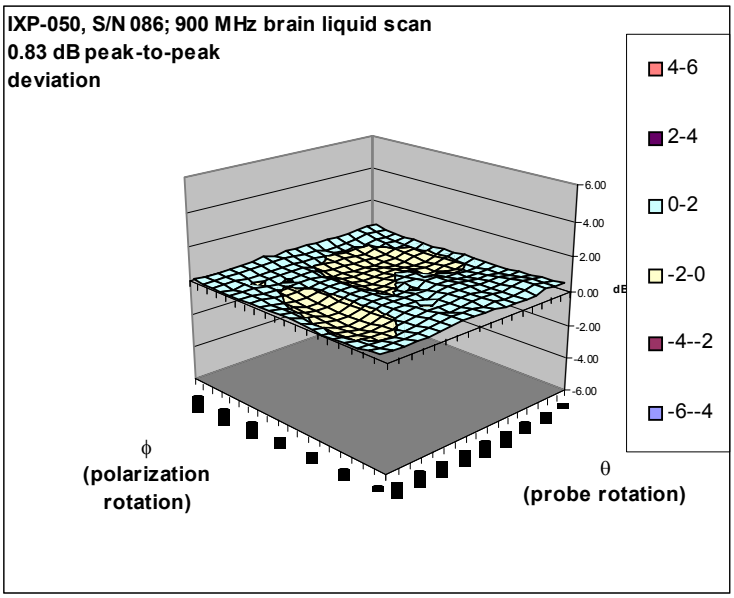
Based upon the data above, it would be appropriate to allow an additional uncertainty of 5-10% for measurements made at 1900MHz using the 1800MHz calibration factors.

Item 6) Use of different fluids (brain and body recipes)

The probe calibrations are expected to be very similar at a specific frequency when used in high permittivity, lossy liquids. To quantify the differences for a specific probe, waveguide calibrations in the actual liquids employed would be necessary. In the absence of this information, general guidance for other diode sensor probes should be applicable.

Since the probe design is optimised for isotropy in brain liquids (of relative permittivity ~40) a more significant change may be the influence of the different relative permittivity of body liquid (~55) on the isotropy of the probes. To check this, isotropy measurements have been made in both brain liquid and body fluid (muscle tissue formulation). The results are shown below for 900MHz liquids:





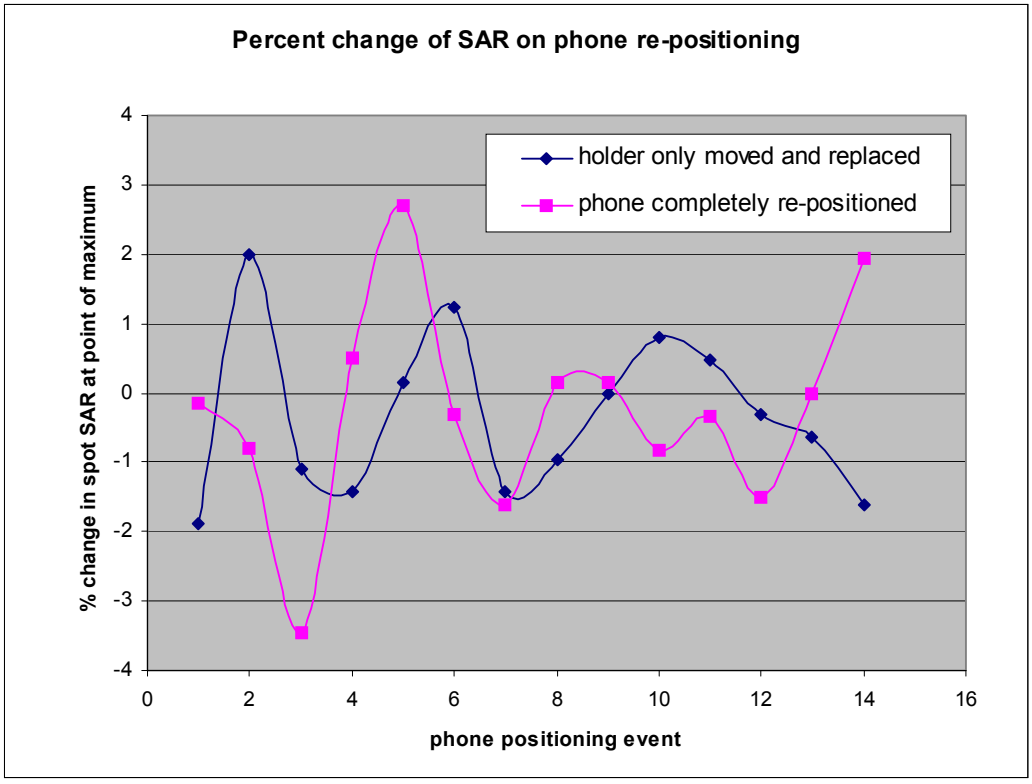
Comparison of the measurements confirms that the isotropy is not significantly different for brain and body fluids.

When all the E-field measurements are averaged over all the probe and source orientations used in the comparisons above, the E-field measured in the body fluid was 2.1% higher than in the brain fluid, but this expected to be due to the different liquid properties.

Item 2) Phone positioning accuracy

To investigate the uncertainty associated with phone positioning, tests were performed by repeatedly re-positioning a phone and examining the effect on the peak SAR reading. An Ericsson T65 phone was used at the LH ear on the 900MHz band. The alignment used was the cheek position. A 2D scan was first done to identify the position of the maximum SAR and the probe was carefully positioned at this point and left stationary for the rest of the measurements (see caution below about this operation). The phone was removed and replaced 15 times by just removing and replacing the holder and 15 times by completely repositioning the phone from scratch. The same operator did all the tests

The battery of the phone was slowly discharging during this period and, to correct for this, the difference between a reading and the previous one is graphed below.



The graph suggests that an uncertainty of +/- 2% occurs when the phone holder is moved away and then replaced, whilst a higher uncertainty of +/- 3% is associated with complete repositioning of the phone.

To aid with optimising the reproducibility of positioning, the operator placed a small mark on the phone at the height of the centre of the earpiece (see photograph). This helps ensure that the length-wise positioning of the phone is consistent. Width-wise positioning is assisted by the ear-mouth line moulded on the shell.

It is also important to check that the front face of the phone sits squarely against the platform of the flattened ear and is not raised more at one side than the other.

Based upon measurements such as these, the allowance of a 10% uncertainty for phone positioning would seem more than adequate.

CAUTION:
Care should be exercised when placing the probe inside the head-shell as described above. Note the positions of the maximum of the 2D scan. Convert the coordinates to robot coordinates for Y and Z. Keep the emergency stop button within reach. First move the probe into the head to depth Z. Ensure the scan mode is constrained. Then move the probe sideways by the Y coordinate and, finally, edge the probe by small increments in the positive X direction until is close to the shell wall.

In time, SARA2 will offer improved support for statically positioning the probe at the location of the maximum, but this facility is not implemented in the current version of the software.