

Checking the sensor-tip distance for six Indexsar IXP-050 immersible SAR probes with opaque PEEK tip enclosures

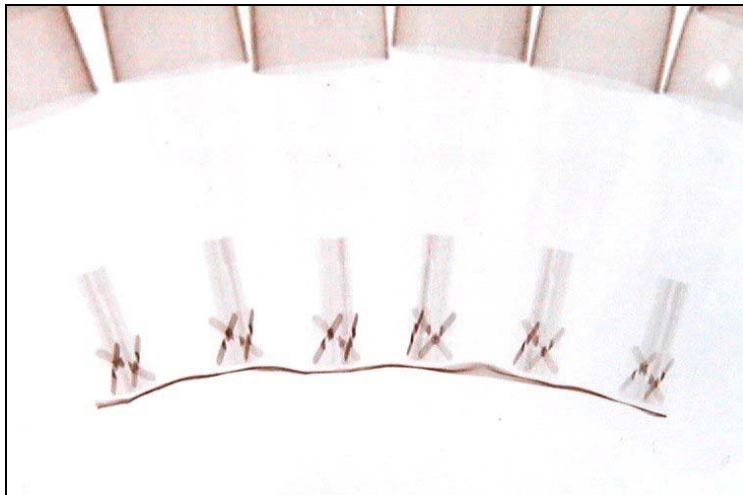
MI Manning
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Introduction

The Indexsar IXP-050 SAR probes contain three E-field sensors in the form of short dipoles interleaved close to the tip of the probe. Component dimensions should ensure that the centre of the dipole array is 2.7mm from the external surface of the tip of the probe, but it is not possible to check this visually after probe construction because the PEEK probe tip is not transparent.

Measurements

To obtain a sensor-tip measurement, a set of 6 SAR probes have been placed together and X-rayed using ordinary dental X-ray equipment. In the figure below, the probes arranged from left to right have serial numbers 0150, 0151, 0152, 0153, 0155 and 0156. The negative image has been transformed into a positive image for display. Because the original negative has accurate 1:1 scaling, it is possible to take dimensional measurements from the image. Prior to the X-ray, an adhesive metal foil was taped across the tips of the 6 probes to provide a clear reference for the location of the tip. This appears as a wavy line in the image.



Findings

The average of the six measurements of the distance between the centre of the sensor arrays and the tips is 2.72mm with a standard deviation of 0.05mm. This dimension, for all six probes, is very close to the nominal value of 2.7mm.