



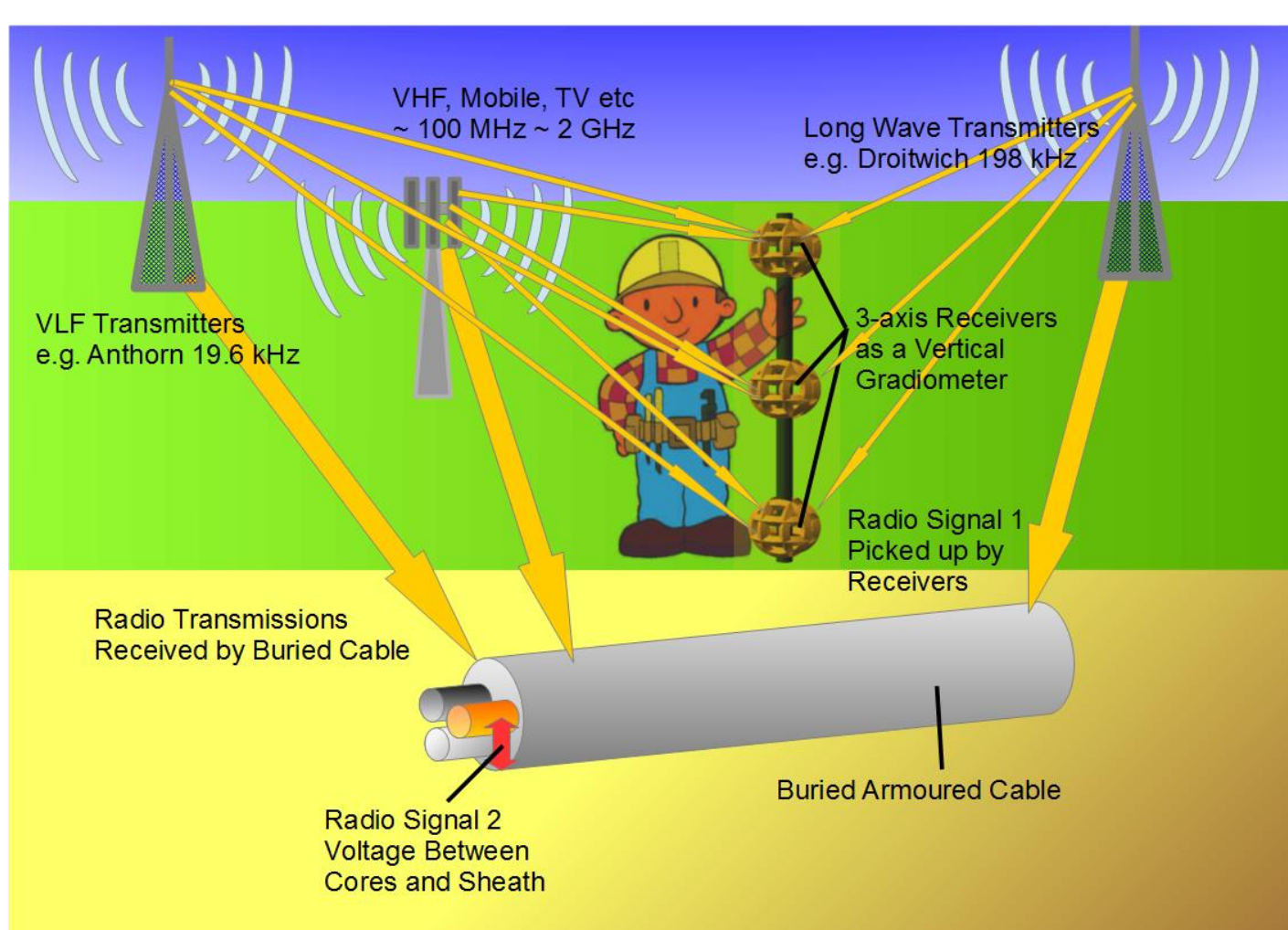
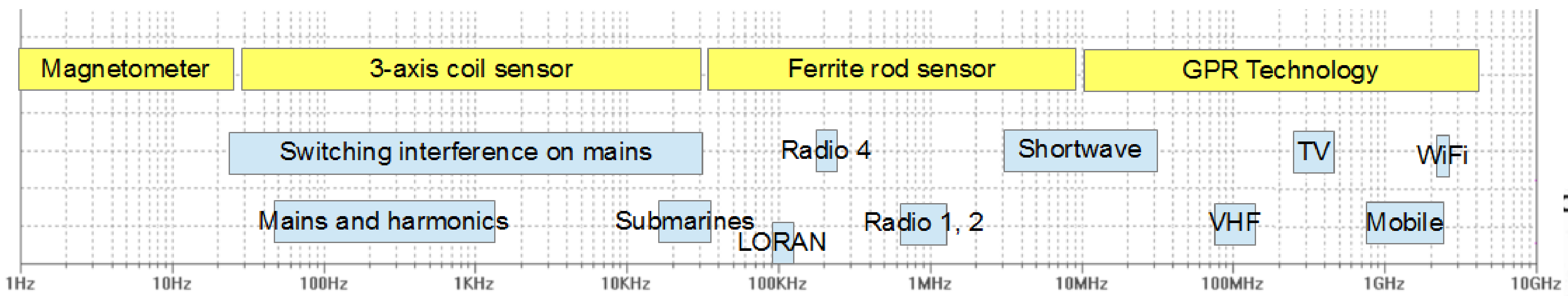
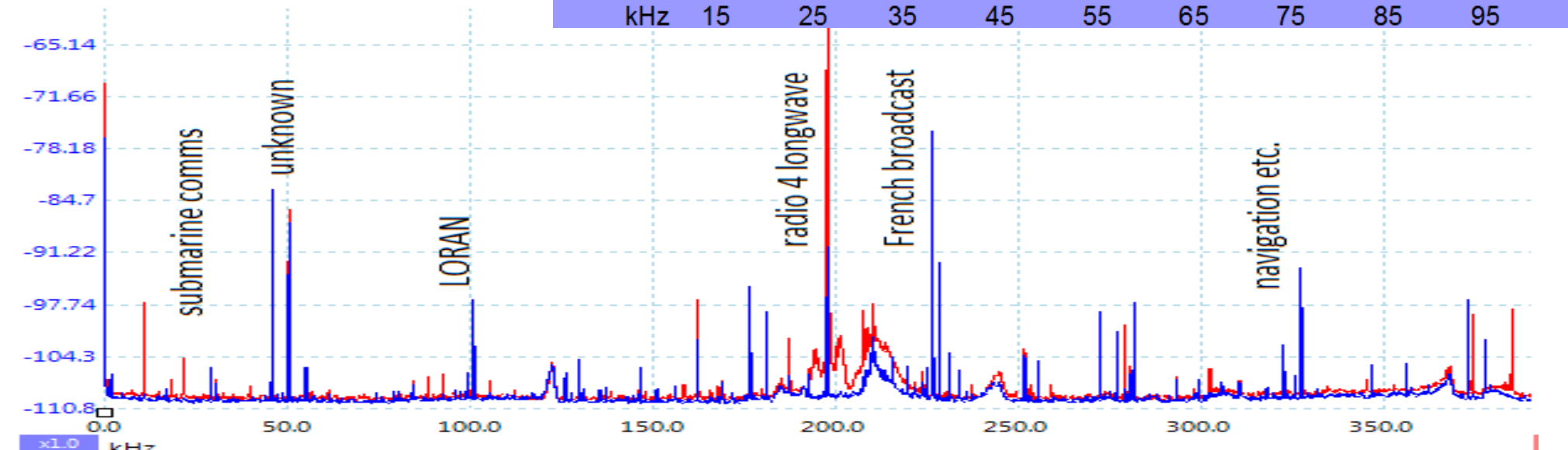
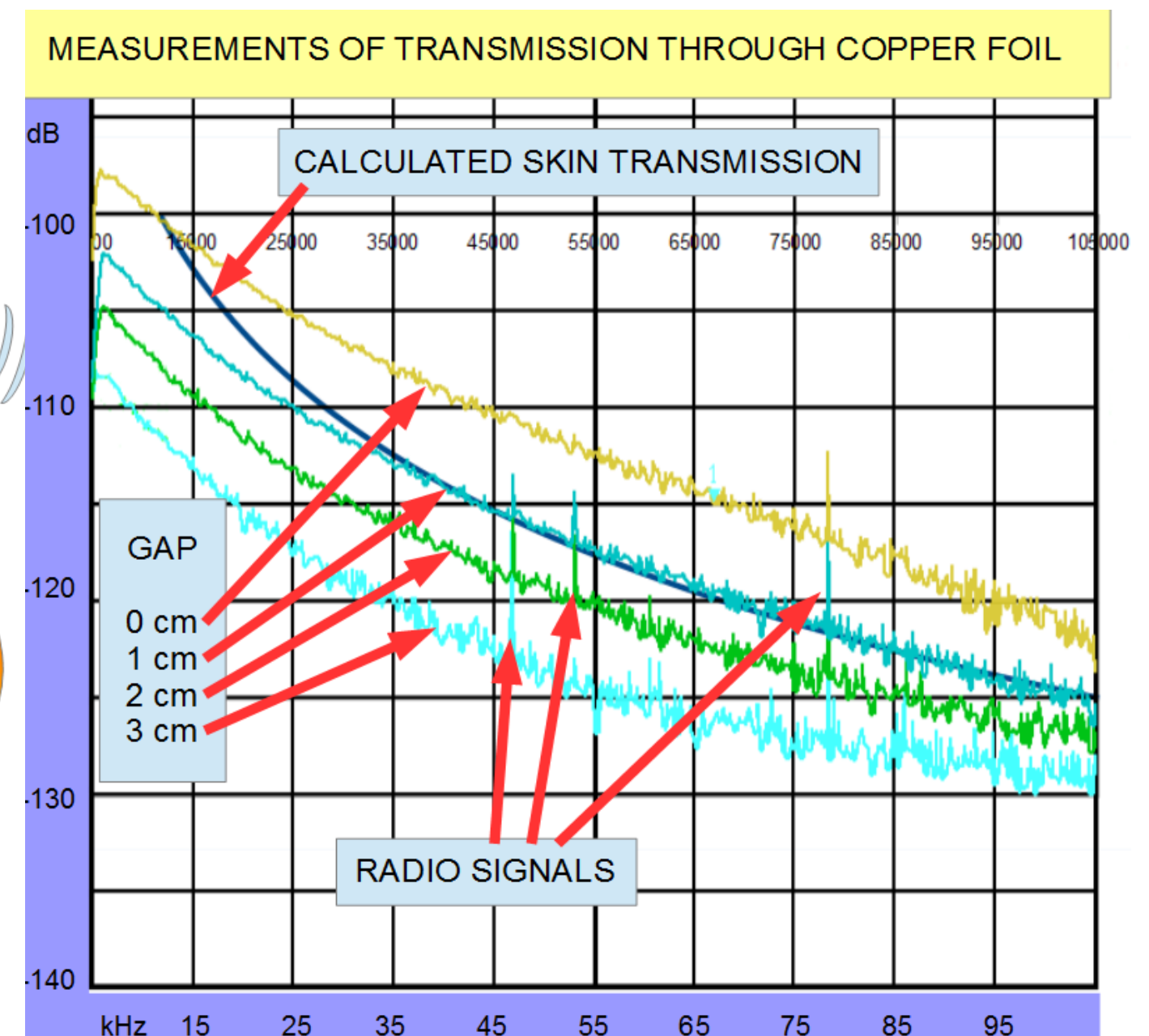
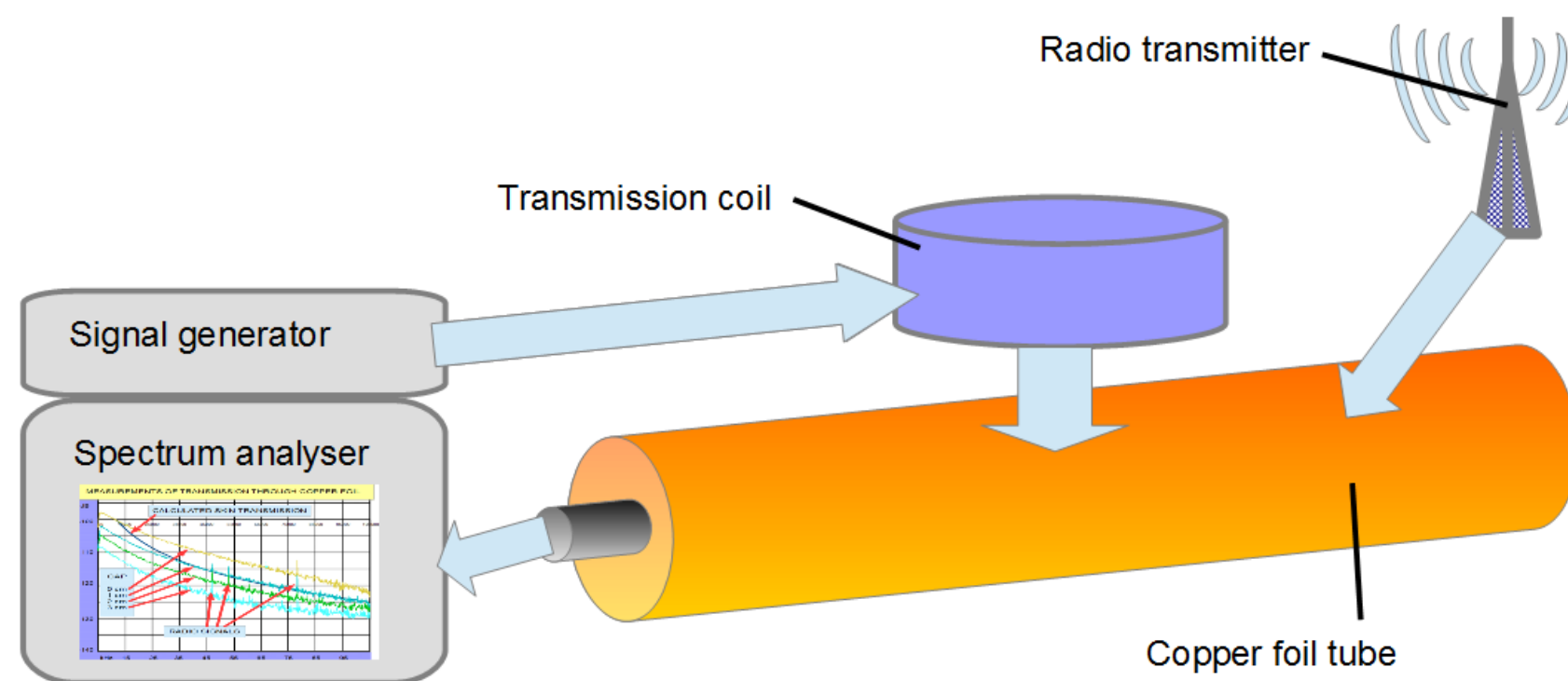
WS3b – High Frequency Electromagnetic and GPR Techniques

S.R. Pennock¹, C.H.J. Jenks¹,

¹ University of Bath, Claverton Down, Bath, BA2 7AY

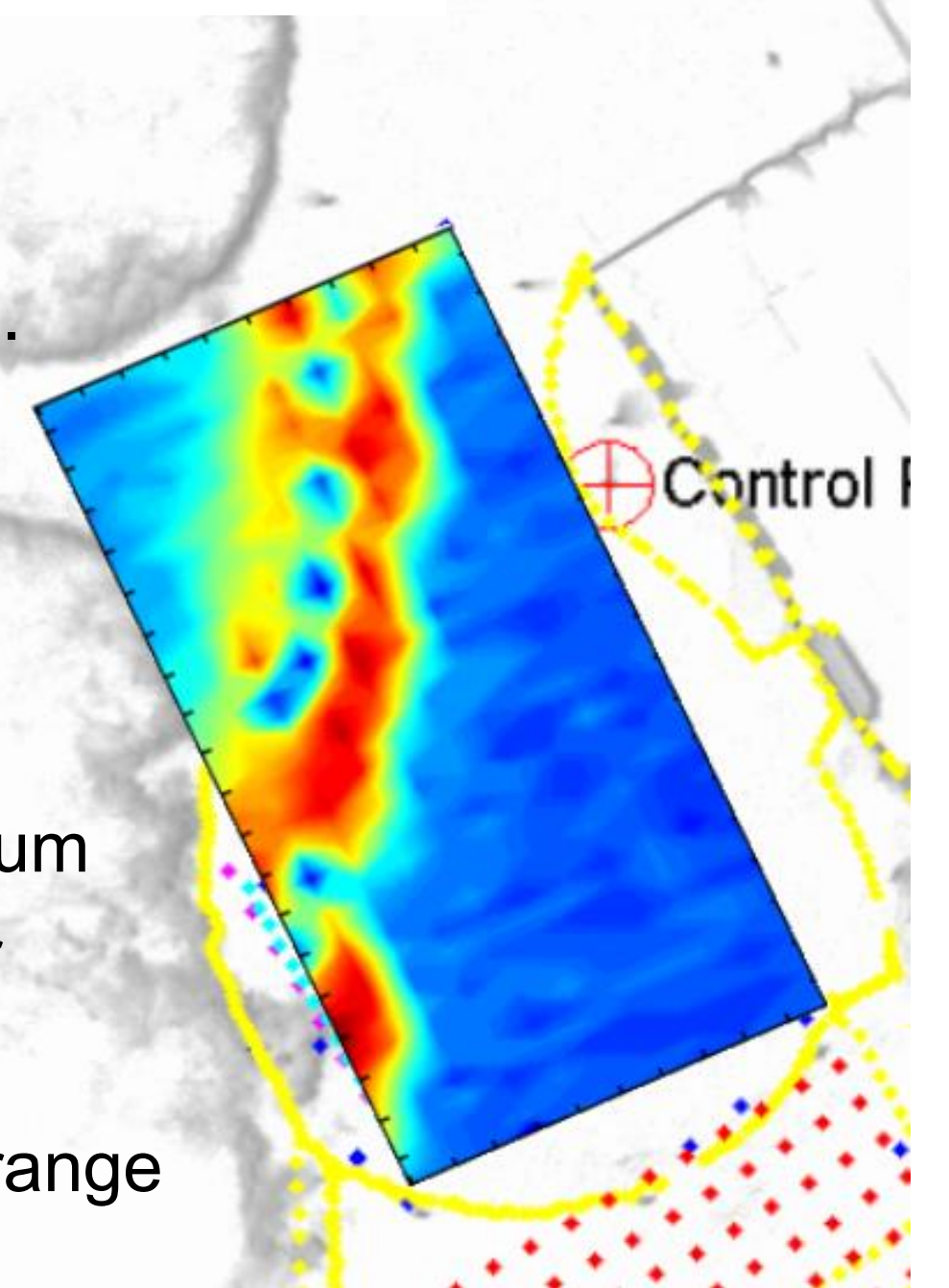
Signals of Opportunity

- Measure the leakage of signals of opportunity through a metal shield to determine the integrity of the shield.
- A tube of thin copper foil and a coil are used to determine the transmission as a function of frequency and gap distance.
- For detecting lower frequencies (submarine, LORAN, medium wave signals) coils with high gain pre-amplifiers are used. In order to determine magnitude and direction the coils are 3-axis types. Three are used as a gradiometer.
- Sensitive from around 30 Hz to 30+ kHz.



Correlation of radio signals 1 and 2 investigates the sheath quality.

- The car park at Glen Eyre halls, Southampton was used as a test site.
- The gradiometer was used.
- The map shows the magnitude of the vertical component of the 150 Hz mains harmonic.
- Note that the signal drops to a minimum when the gradiometer is directly over the buried cable, as expected.
- The minima (null) between the two orange maxima is relatively narrow.



Transmission Line Antenna Scanning

- Potential for rapid scanning along lengths of tens of metres of roadways and cable runs.
- Investigations have identified desired bandwidths and source signals.
- First demonstrator experiments planned with 200Ms/sec DAC/ADC hardware.

