Jen

To investigate a variety of ground excitation methods to interrogate both the ground and the buried infrastructure.

Apodization

2. Dispersion characteristics (examined waves)

Modelling & experimental work has been undertaken to use deconvolution techniques: CLEAN. Information gleaned from electromagnetic & seismic waves can be used to estimate their location and extent.

A novel Near Field measurements show that tree roots leave a soil shear stiffness component, A purpose-built model used in laboratory experiments (prestress waves)

Road and Soil Characterization

- Modelling & experimental work has been undertaken to develop methods to determine soil elastic properties in situ.
- Detect and locate cracks in road/pavement surfaces.
- Other means of excitation under consideration.

Pipe Excitation Technique

- Waves propagating along pipe will radiate to the ground surface.
- Axial dependence of waves in pipe mirrored in ground surface response.
- Reflections from discontinuities in pipe (holes/cracks) will manifest as sudden changes in ground surface response.
- Changes in the soil will also affect ground surface response, with rapid changes resulting in wave reflections and corresponding peaks in magnitude.

Torsional Motion

- Torsional motion may be linked to certain types of pipe failure, in particular spiral fractures of cast iron pipes.
- Ultrasonic inspection techniques frequently exploit torsional waves but little is known about their behaviour at audio frequencies.
- Modelling work has been undertaken to predict dispersion characteristics (wave speed & attenuation) for buried cast iron/plastic pipes.
- Ground surface response as a result of torsional wave motion in pipe.

Shear wave Excitation: Signal Processing

- A novel Near-Surface wave estimation technique via focusing of the array on the surface.
- Use of Dual-Apodisation and other array signal-processing techniques.

Pipe Excitation

- Use of deconvolution techniques: CLEAN.

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