Crack and Void Detection in Pavement Structure

- Most scattering when antennas at 90° and 10° away from angles of incidence = reflection.
- Voids introduce a significant cross polarised signal. Cross polarised antennas are mutually ‘isolated’.
- Little influence at traditional GPR frequencies below 1 GHz, but observable scattering above 3 GHz. High frequencies limit depth of detection due to higher attenuation in the ground.
- Dielectric wedge antenna investigated - sensitive to laterally propagating cross polarised waves caused by voids in the ground.

Soil Structural and Electromagnetic Changes Due to Pipe Corrosion

- Corroding pipe contaminates soil next to pipe. Degree of contamination reduces with distance from the pipe. Various experimental and theoretical profiles investigated.
- Main factor affecting reflection is the total attenuation through the contaminated soil, the profile shape is a secondary influence.
- Significant reductions in reflection at common GPR frequencies but not at low (<100 MHz) frequencies.

Publications