

# 非破壞性電磁波顯像滲漏檢測系統

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## 摘要

The digital Ground Penetrating Radar (GPR) system is developed for inspection the pipeline water leaking in concrete material. This allows for leakage to be detected and estimated from the radargrams. A physical model is presented for the digital electromagnetic signature of a buried pipeline leakage, which takes into account the range of water leaking. This is achieved by subjecting GPR radargrams to a series of digital image processing stages, followed by different relative permittivity within the energy zone during the motion of the GPR antenna along the concrete surface. Relative permittivity for vertically or horizontal oriented migration traces was generated. The moisture range between variant relative permittivity and the characteristics of reflected signals of an energy footprint can be considered. The results indicate that, this non-destructive system is capable of inspection the location of leakage in the concrete material.

關鍵字：GPR、pipeline leakage