

# 應用透地雷達法於老舊隧道襯砌混凝土完整性之研究

張奇偉, 任景城

土木工程學系

建築與設計學院

ccw@chu.edu.tw

## 摘要

At present, using GPR on testing of structures is a common method, and many researches have been conducted on this area. However, there is scanty research on the thickness, fractures, and voids of the concrete structure of tunnel lining. Therefore, this study aimed to use GPR with a frequency of 1GHz to test the tunnel lining concrete. Based on the electromagnetic wave propagation theory and using signal processing technology, this study determined the thickness, fractures, and voids of the tunnel lining concrete. The analytical method varies with different media as the dielectric constants are different, thus the electromagnetic wave reflection signal features and propagation phenomena would vary. Then discussion was conducted on the relationship of the magnitude of reflection signal energy and variation of waveform.

關鍵字：Ground Penetrating Radar, Tunnel lining concrete, Dielectric constant, Electrical oscillation