

## 透地雷達探勘地質構造的新資料處理方法

### A Renovated Processing Scheme for the Ground Penetrating Radar Technology to Image Geological Features

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#### 摘 要

透地雷達方法是一種快速、經濟、無破壞的非侵入性地球物理探測技術，但數據的處理與解釋仍存在許多未解的問題，造成此探勘方法的瓶頸。本文對透地雷達方法從理論、儀器、施測、資料處理、到結果解釋，先做一簡單但不失周延的整理與探討。並以一可驗證的野外地質案例顯示數據處理解釋的陷阱與解決方法。文中對同一組野外數據，分別以傳統的標準處理流程與一新的處理技術處理比對，說明不同的技術概念可導致處理結果相當程度的差異。因此選擇適當的資料處理方法及判斷信號與雜波是透地雷達測勘成功的關鍵。本文所提出之新的處理方法，簡單、直接、有效，相信有助於提昇透地雷達在地質、工程、與環境的應用層次。

**關鍵詞：**透地雷達、資料處理、非線性數據解析。

#### Abstract

Ground penetrating radar imaging is a fast, cost-effective, nondestructive and noninvasive geophysical method that has been applied extensively in engineering, environmental, and geological investigations. Through a brief review of the ground penetrating radar method followed by a study of real example with visible structure, we demonstrate the pitfalls of the data processing and the feasibility of solving this problem. We processed the field data by using both the conventional scheme and an innovative nonlinear filtering method. The results indicate that different processing concepts lead to diverse conclusions, and a scheme to distinguish the signal from artifacts is crucial for a successful ground penetrating radar survey. The proposed method is simple and effective; it should be of considerable value to investigators interested in the ground penetrating radar method.

**Key words:** Ground penetrating radar, Data processing, Nonlinear data analysis.

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100 年 1 月 13 日收件 100 年 2 月 25 日受理

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