

全波場地震波形的方法與應用

(Full-Wave Seismic Waveform Inversion: Theory and Practice)

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在傳統的地震波逆推方法中，有兩種近似常常被用來簡化問題並減小對計算的需求。一種近似是選擇簡單的速度結構，例如儘隨深度變化的一維結構，來作為地球初始模型。另一種近似是假定地震波是高頻信號，因而可以使用射線理論來模擬地震波的傳播。這兩種近似在特定的研究條件與目標下有其合理性，也為我們對地球內部結構的了解提供了很多有價值的結果。然而在今天為達到對小尺度結構，特別是近地表三維結構認知的目的，這兩種簡化處理都不再適用。我們最近幾年來以洛杉磯盆地三維結構為目標，發展了一種新的逆推方法，以三維結構為地球初始模型，用波形測量的數據結合精確的對結構的敏感度函數來得到三維速度結構。逆推結果證明了該方法的可靠性，可行性及可推廣性。

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