

地球物理学报 » 2014, Vol. 57 » Issue (3) :932-938 doi:10.6038/cjg20140322

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引用本文(Citation):

张先武, 高云泽, 方广有. 2014. 消除探地雷达数据的子波衰减和频散的反滤波方法. 地球物理学报, 57(3): 932-938, doi: 10.6038/cjg20140322

ZHANG Xian-Wu, GAO Yun-Ze, FANG Guang-You. 2014. An inverse filtering method for removing the wavelet attenuation and dispersion of Ground Penetrating Radar data. Chinese Journal Geophysics, 57(3): 932-938, doi: 10.6038/cjg20140322

消除探地雷达数据的子波衰减和频散的反滤波方法

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An inverse filtering method for removing the wavelet attenuation and dispersion of Ground Penetrating Radar data

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摘要

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摘要

消除探地雷达数据的子波衰减和频散可以很好地提高探地雷达的勘探深度和勘探分辨率. 常用的消除探地雷达数据的子波衰减和频散方法为反 Q 滤波方法. 该方法需要利用地下介质的 Q 参数, 但是正确求取地下介质的 Q 参数很困难. 针对这一问题, 本文提出了一种消除探地雷达数据的子波衰减和频散的反滤波方法. 该方法以地下介质反射系数是随机数为前提, 利用地下介质等效滤波器具有最小相位这个特性, 通过求取等效滤波器的振幅谱来求取等效滤波器的反滤波器. 最后, 利用该反滤波器对探地雷达数据进行反滤波, 实现消除探地雷达数据的子波衰减和频散.

关键词 探地雷达, 衰减和频散, 反滤波

Abstract:

To remove the wavelet attenuation and dispersion of Ground Penetrating Radar data can greatly improve the exploration depth and resolution of Ground Penetrating Radar. Inverse Q filtering is the common method used to remove the wavelet attenuation and dispersion. This method needs to use the Q parameter of the underground medium, but it is quite difficult to calculate the Q parameter accurately. To deal with the problem, this paper proposes an inverse filtering method which is established on the basis that the underground media reflection coefficient is random. The method takes advantage of the characteristics that underground media equivalence filter has the minimum phase and obtains inverse filter of equivalence filter through calculating amplitude spectrum of equivalence filter. At last, making using of inverse filter to filter the Ground Penetrating Radar data, wavelet attenuation and dispersion of Ground Penetrating Radar data is removed.

Keywords [Ground Penetrating Radar](#), [Attenuation and dispersion](#), [Inverse filtering](#)

Received 2012-12-13;

Fund:

国家高技术研究发展计划(2012AA061403)资助.

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