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地震映像数据的时频分析方法及应用

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摘要　本文研究地震映像数据的时频解释方法.采用短时傅立叶变换方法获得地震映像记录频谱的时间与空间分布，根据介质对地震波频谱影响的基本规律，通过分析已知地质断面地震映像记录频谱的时间与空间分布，研究了综合利用频率域和时间域信息进行地震映像数据解释的效果.时频分析方法提取了地震波的频谱中关于地层岩性、构造方面的信息，为地震映像数据的处理和解释提供了更多的参考信息.实例证明，利用时频分析解释地震映像数据，有助于了解覆盖层下岩性变化、薄层的分布范围、探测隐伏土洞、确定混凝土构件中缺陷位置，提高地震映像数据的解释精度和准确性.

关键词　地震勘探,地震映像,时频分析

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Application of time-frequency analysis method for seismic imaging data

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Abstract This paper deals with the interpretation of seismic imaging data by the time-frequency analysis method. The time and space distribution of the seismic spectrum is obtained by short-time FT transform. According to the relationship of media and its seismic spectrum, by the comparison of the known geological section and the related distribution of the seismic spectrum, the effectiveness of the time-frequency analysis method is demonstrated. By use of time-frequency analysis, the information of geological stratum and structures contained in seismic spectrum is extracted and then serves as the important reference in the processing and interpretation of seismic imaging data. Several history cases on determining subsurface rocks, outlining the distribution of thin clay layers, detecting underground cavities and allocating defects in concrete frames by combined use of time domain and spectra domain analysis of seismic imaging data are presented. It is found that the precision and correction of interpretation of seismic imaging data can be improved by combined application of time and spectra information.

Key words P315

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