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论文

瞬变电磁场资料的联合时-频分析解释

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摘要: 本文充分利用瞬变电磁(TEM)信号包含的信息,采用联合时-频分析方法解释了TEM资料。文章选取了Wigner-Ville分布和Gabor展开的联合时-频分布(或表示),将一维时间域信号拓展到时-频二维平面上,不仅将不同地电断面的响应成功地分开来,而且所显示的信号特征与地层电性结构之间有着明确的物理意义,从时间和频率两个方面同时描述了瞬变涡流场在地层中的激发和衰减的过程。利用时间窗数据和频率窗数据所进行的联合时-频反演,缩小了拟合差,提高了定量解释精度。

关键词: 瞬变电磁信号 联合时-频分析 定性解释 定量解释

Interpretation of transient electromagnetic field data using joint time-frequency analysis

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Abstract: Using the joint time-frequency(TF) analysis method, we interpret transient electromagnetic(TEM) data so as to fully employ information contained in TEM signals. We chose joint TF distribution(or representation) of Wigner-Will distribution and Gabor expansion

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闫述

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to transform the one-dimensional time-domain signal to two-dimensional TF plane, which not only distinguishes responses of the different geo-electric sections from each other successfully, but also provides clear physical meaning between exhibited signal feature and electrical structure. This describes the transient eddy field exciting and underground attenuating process in time and frequency respects. The fitting difference is reduced and the precise of quantitative interpretation is improved by means of joint TF inversion with time and frequency window data.

Keywords: Transient electromagnetic signal