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迭代抛物Radon变换法分离一次波与多次波

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Iterative parabolic Radon transform for primary and multiple separations

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摘要

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摘要 Radon变换法是进行一次波与多次波分离的常用手段, 最小平方约束下的频率域抛物Radon变换将  $t-x$  域数据转换到Radon域后, 因存在剪刀状发散的截断效应, 用传统方法难以彻底分离一次波和多次波。针对这一缺陷, 提出了迭代抛物Radon变换法, 即在Radon域截取一次波聚焦点附近很小区域内的数据为初始数据, 经过Radon反变换和正变换后得到新的Radon域数据, 然后用初始数据覆盖对应的小区域, 经过迭代, 最终得到保幅效果较好的一次波, 且几乎不含多次波。利用相同的方法, 也可以得到几乎不含一次波的多次波。最后通过理论模型和实际资料的处理, 验证了本文方法的正确性和有效性。

关键词: Radon变换 迭代法 一次波 多次波 波场分离

Abstract: Radon transform is commonly used in the separation of the primary from multiples. After least square parabolic Radon transform in frequency domain, the data in  $t-x$  domain is transformed into Radon domain. The Radon transform image reveals spatial truncation effect and the linear events cross-hatching the image. So it is difficult to completely separate the primary from multiples by the conventional method. Therefore we propose iterative parabolic Radon transform in this paper. Selecting data in a small area near the focus of the primary in Radon domain as initial data, we can get new Radon field data after inverse Radon transform and forward Radon transform. Then we conduct iterations in the area of the initial data, and finally obtain primaries with well-preserved amplitude and no multiples. With this method, we can also get multiples without primaries. The correctness and effectiveness of the method is proved by tests on theory model and real data.

Keywords: Radon transform iteration method primary multiple wave-field separation

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