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混合域高分辨率抛物Radon变换及在衰减多次波中的应用

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Hybrid-domain high-resolution parabolic Radon transform and its application to demultiple

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摘要

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摘要 高分辨率Radon变换存在计算效率和分辨率不能兼得的困境. 时间域算法可以获得很高的分辨率, 但计算效率非常低; 频率域算法具有良好计算效率, 但分辨率不理想. 为此发展了混合域高分辨率抛物Radon变换, 即对频率域抛物Radon变换引入时变的稀疏权. 本文给出了一种新的混合域高分辨率抛物Radon变换实现方法, 并将该算法应用于叠前数据衰减多次波. 文中给出了Radon变换和衰减多次波的流程. 理论和实际数据算例表明本文方法既有较高的分辨率又有很高的计算效率.

关键词 高分辨率Radon变换, 稀疏反演, 循环矩阵, 衰减多次波

Abstract: There are two alternative choices for either efficiency or resolution in today's high-resolution Radon transform algorithms. Time-domain high resolution Radon algorithm confronts serious efficiency degeneration while maintains much higher resolution than any other methods. On the contrary, frequency-domain high-resolution Radon algorithm generally leads to efficient computation at the cost of more smearing and artifacts in Radon domain. To overcome these problems some methods concerning hybrid-domain computation were developed which utilized time-variant sparse weight for frequency domain Radon transform. We propose a new method of the hybrid-domain computation named hybrid-domain high-resolution parabolic Radon transform and use it to suppress multiples for prestack seismic data. Routines for hybrid-domain high-resolution parabolic Radon transform and prestack data demultiple are provided respectively in our paper. Numerical tests of modeling and field data confirm ideal resolution and very high efficiency of our method.

Keywords [High-resolution Radon transform](#), [Sparse inversion](#), [Circular matrix](#), [Demultiple](#)

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