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基于辛格式奇异核褶积微分算子的地震标量波场模拟

李一琼[1,2], 李小凡[1], 朱童[1,3]*

1. 中国科学院地质与地球物理研究所,北京 100029;
2. 中国地震局地球物理研究所,北京 100081;
3. 中国石油化工股份有限公司石油物探技术研究院,南京 210014

The seismic scalar wave field modeling by symplectic scheme and singular kernel convolutional differentiator

LI Yi-Qiong[1,2], LI Xiao-Fan[1], ZHU Tong[1,3]*

1. Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China;
2. Institute of Geophysics, China Earthquake Administration, Beijing 100081, China;
3. Geophysical Research Institute, SINOPEC, Nanjing 210014, China

摘要 本文在对地震波场进行模拟时,采用辛差分格式对波动方程进行时间离散,采用奇异核褶积微分算子对波动方程进行空间离散.该方法尽管增加了一些计算量,但提高了计算精度和稳定性;相对于其他非辛算法,它是全局保结构的,并且具有较强的长时间跟踪能力.该方法为解决大尺度、长时程地震波场的高精度模拟问题提供了一种新的、有效的选择.

关键词: 辛算法 奇异核褶积微分算子 地震波模拟

Abstract: The paper adopts both symplectic difference scheme and singular kernel convolutional differentiator for modeling of seismic scalar wave field. For this method, the computational accuracy and stability have been greatly improved with a slight increase of calculation amount. Compared with other non-symplectic numerical methods, major advantages of the method presented in this paper are the structure-preserving property and long-term simulations. These appealing characters of the algorithm would make it effective to model the large-scale and long-term seismic wave propagation.

Keywords: Symplectic algorithm Singular kernel convolutional differentiator Seismic modeling

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About author: 李一琼,女,满族,1979年生,在读博士研究生,主要从事地震波传播理论和数值模拟的研究工作.E-mail:liyq@mail.igcas.ac.cn

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