

论文

辛几何算法在射线追踪中的应用

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摘要:

关键词:

RAY TRACING BY SYMPLECTIC ALGORITHM

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Abstract:

Ray tracing is a basic aspect in tomography. To solve the caustic problem in inhomogeneous media using Maslov asymptotic theory, we need to calculate the position and slowness vector at every point. Therefore, ray tracing must rely on the ray equations in Hamiltonian form. In this paper, fourth order symplectic scheme and nonsymplectic Runge-Kutta scheme are compared in ray tracing for sinusoidal velocity model. The result indicates that ray paths obtained by two schemes are almost the same. But on keeping Hamilton quantities, the symplectic scheme is far better than the Runge-Kutta scheme. On computing travel time for Hamiltonian system with T parameter, we use trapezoid formula for numerical integration. The result coincides with that obtained using Hamiltonian system with t parameter.

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