**报告摘要**

In the study of symplectic integrators, long-time near-conservation of first integrals were numerically validated and rigorously analyzed by using backward error analysis combining with some techniques in KAM theory. As for numerically solving Hamiltonian partial differential equations (HPDEs), long-time near-conservation phenomena of conservation laws and invariants are frequently observed as well, but the theoretical analyses are relatively few. One of the biggest obstacles, as pointed out in literature, is the fact that the semi-discretized system becomes stiffer when the spatial grid is refined and this severely limits generalization of many strategies developing in ODEs to PDEs. A temporal multiscale expansion also called modulated Fourier expansion (MFE) method, which was first used for studying long-time numerical conservation for highly oscillatory ODEs, has been elaborately extended to the numerics of HPDEs. Some error estimates on long-time near conservation properties are obtained, whereas several low-order symplectic or symmetric integrators applied to the corresponding well-designed spatial semi-discretization systems. The estimates are commonly in the form of (or ) with (or ), which is distinguished from the traditional convergence ones in with . Here is a small positive parameter, and are respectively the temporal and spatial stepsizes, etc. In this presentation, we make an attempt to extend the MFE method to some multi-symplectic integrators applied to multi-symplectic HPDEs and explain theoretically some related long-time near-conservation numerical behavior.