

# A FAMILY OF DIFFERENCE SCHEMES WITH FOUR NEAR-CONSERVED QUANTITIES FOR THE KdV EQUATION

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摘要

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# A FAMILY OF DIFFERENCE SCHEMES WITH FOUR NEAR-CONSERVED QUANTITIES FOR THE KdV EQUATION

Zhen Han(1), Long-jun Shen(2)

(1)Department of Computer Science and Technology, Northern Jiaotong University, Beijing 100044, China; (2)Institute of Applied Physics and Computational Mathematics, Beijing 100088, China

**Abstract** We construct and analyze a family of semi-discretized difference schemes with two parameters for the Korteweg-de Vries (KdV) equation. The scheme possesses the first four near-conserved quantities for periodic boundary conditions. The existence and the convergence of its global solution in Sobolev space  $\{ \mathbf{L} \}_{\infty} (0, T; \{ \mathbf{H} \}^3)$  are proved and the scheme is also stable about initial values. Furthermore, the scheme conserves exactly the first two conserved quantities in the special case.

**Key words** [Convergence](#) [difference scheme](#) [KdV equation](#) [conserved quantity](#)

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