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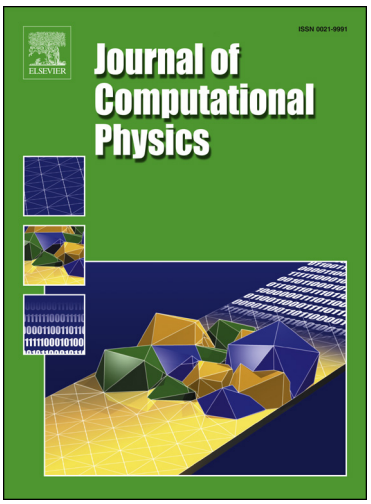

Galerkin finite element method for two-dimensional space and time fractional Bloch-Torrey equation

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Highlights

- Galerkin finite element method for the two-dimensional space and time fractional Bloch-Torrey equation is proposed.
- $L2-1_\sigma$ fractional numerical differentiation formula is used to approximate the Caputo fractional derivative in time.
- Utilizing the $L2-1_\sigma$ formula, the semi-discrete form for the problem with order $3-\alpha$ in temporal direction is obtained, and stability and convergence of the semi-discrete variational formulation are investigated.
- Convergence of the fully discrete scheme is investigated.
- Some numerical examples based on linear piecewise polynomials are given to prove the correctness of the theoretical analysis.

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