A fast second-order discretization scheme for the linearized Green-Naghdi system with absorbing

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In this talk, I will present a fully discrete second-order finite-difference scheme with fast evaluation of the convolution involved in the absorbing boundary conditions to solve the one-dimensional linearized Green-Naghdi system. The Padé expansion of the square-root function in the complex plane is used to implement the fast convolution. By introducing a constant damping parameter into the governing equations, the convergence analysis is developed when the damping term fulfills some conditions. In addition, the scheme is stable and leads to a highly reduced computational cost and low memory storage. A numerical example is provided to support the theoretical analysis and to illustrate the performance of the fast numerical scheme.

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