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Summary: We present a new space–time SUPG formulation of the shallow-water equations. In this formulation, we use a stabilization parameter that was introduced for compressible flows and a new shock-capturing parameter. In the context of two test problems, we evaluate the performance of the new shock-capturing parameter. We also evaluate the performance of the space–time SUPG formulation compared to the semi-discrete SUPG formulation, where the system of semi-discrete equations is solved with the central-difference (Crank–Nicolson) time-integration algorithm.

MSC:

35Q35 PDEs in connection with fluid mechanics
76M10 Finite element methods applied to problems in fluid mechanics

Keywords:

shallow-water equations; finite element method; space; time method; SUPG formulation; shock-capturing parameter

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