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**Simulation of shallow-water systems using graphics processing units.** (English) Zbl 1423.76302  
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**Summary:** This paper addresses the speedup of the numerical solution of shallow-water systems in 2D domains by using modern graphics processing units (GPUs). A first order well-balanced finite volume numerical scheme for 2D shallow-water systems is considered. The potential data parallelism of this method is identified and the scheme is efficiently implemented on GPUs for one-layer shallow-water systems. Numerical experiments performed on several GPUs show the high efficiency of the GPU solver in comparison with a highly optimized implementation of a CPU solver.

**MSC:**

**76M12** Finite volume methods applied to problems in fluid mechanics  
**35Q35** PDEs in connection with fluid mechanics  
**65Y10** Numerical algorithms for specific classes of architectures

Cited in 5 Documents

**Keywords:**

shallow-water simulation; general-purpose computation on graphics processing units (GPGPU); high performance scientific computing

**Software:**

Cg; CUDA; OpenGL

**Full Text:** [DOI](#)

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