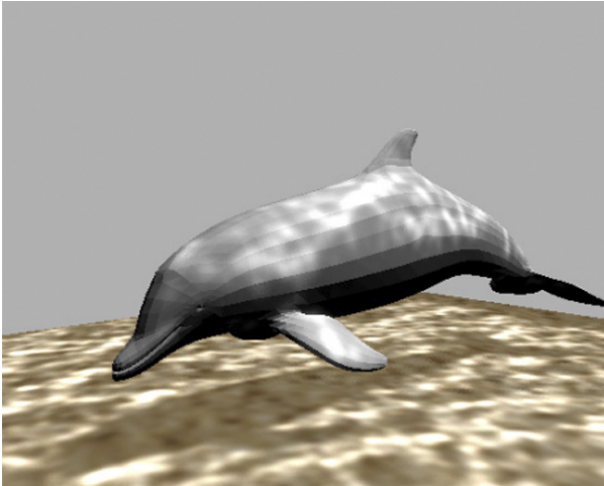


# Real-time lattice boltzmann shallow waters method for breaking wave simulations.

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We present a new approach for the simulation of surface-based fluids based in a hybrid formulation of Lattice Boltzmann Method for Shallow Waters and particle systems. The modified LBM can handle arbitrary underlying terrain conditions and arbitrary fluid depth. It also introduces a novel method for tracking dry-wet regions and moving boundaries. Dynamic rigid bodies are also included in our simulations using a two-way coupling. Certain features of the simulation that the LBM can not handle because of its heightfield nature, as breaking waves, are detected and automatically turned into splash particles. Here we use a ballistic

particle system, but our hybrid method can handle more complex systems as SPH. Both the LBM and particle systems are implemented in *CUDA*, although dynamic rigid bodies are simulated in *CPU*. We show the effectiveness of our method with various examples which achieve real-time on consumer-level hardware.