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**Vera Mikyoung Hur\***, 1409 W Green Street, University of Illinois at Urbana-Champaign,  
Department of Mathematics, Urbana, IL 61801. *Stokes waves in a constant vorticity flow: theory  
and numerics.*

Stokes in the 1800s made many contributions about periodic waves at the surface of water, under the influence of gravity, propagating in permanent form a long distance at a practically constant velocity. In an irrotational flow, for instance, he observed that crests become sharper and troughs flatter as the amplitude increases, and that the so-called wave of greatest height, or extreme wave, possesses a 120 degree's angle at the crest. The irrotational flow assumption is justified in many situations, and facilitates rigorous analysis and numerical computation. However, rotational effects are significant in many others. I will review recent progress in a constant vorticity flow. Numerical findings include folds and gaps in the wave speed vs. amplitude plane, and a profile enclosing multiple bubbles of fluids. I will discuss analytical and numerical applications if time permits. (Received August 12, 2020)