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Shengfu Deng* (sfdeng@vt.edu), Department of Mathematics, Virginia Tech, Blacksburg, VA 24061, and **Shu-Ming Sun** (sun@math.vt.edu), Department of Mathematics, Virginia Tech, Blacksburg, VA 24061. *Three-Dimensional Generalized Solitary Waves via a Spatial Dynamical Approach.*

In this talk, we consider the three-dimensional gravity-capillary waves on water of finite-depth which are uniformly translating in horizontal propagating direction and periodic in transverse direction. The exact Euler equations are formulated as a spatial dynamical system instead of using Hamiltonian formulation method. A center-manifold reduction technique and a normal form analysis are applied to show that the dynamical system can be reduced to a system of ordinary differential equations. Using the existence of a homoclinic orbit connecting to a two-dimensional periodic solution for the reduced system, it is shown that such a generalized solitary-wave solution persists for the original system by applying a perturbation method and adjusting some appropriate constants. (Received September 13, 2007)