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Nghiem V. Nguyen* (nvnguyen@math.purdue.edu), Department of Mathematics, Purdue University, 150 N. University Street, West Lafayette, IN 47907, and **Min Chen** and **Shu-ming Sun**. *Stability of Solitary Wave Solutions to Boussinesq System with Large Surface Tension*. Preliminary report.

The four-parameter family of Boussinesq system

$$\{\eta_t + u_x + (\eta u)_x + au_{xxx} - b\eta_{xxt} = 0, u_t + \eta_x + uu_x + c\eta_{xxx} - du_{xxt} = 0, \quad (1)$$

introduced by Bona-Chen-Saut to describe the motion of small-amplitude and long waves on the surface of an ideal fluid under the force of gravity has been generalized to include surface tension case. The parameters a, b, c, d are not independently specified but must obey the consistency conditions

$$a + b + c + d = \frac{1}{3} - \tau \quad (2)$$

where τ being the surface tension coefficient which we assume to satisfy $\tau \geq 1/3$.

In this talk, the stability of solitary waves of the system (1) with

$$b = d > 0, \quad a, c < 0, \quad ac \geq b^2 \quad (3)$$

is studied. It is noted that condition (3) implies $a + b + c + d \leq 0$ and therefore $\tau \geq \frac{1}{3}$ —the large surface tension case. The special properties of this class of systems include established global well-posedness and some conserved quantities, which enable the use of the technique of constrained global minimization. (Received January 23, 2008)