Meeting: 1001, Evanston, Illinois, SS 14A, Special Session on Nonlinear Waves

1001-35-327 **Hongqiu Chen*** (hchen1@memphis.edu), Dept. of Math, Statistics & Computer Science, University of Illinois at Chicago, Chicago, IL 60607, **Jerry L Bona** (bona@math.uic.edu), Dept. of Math, Statistics & Computer Science, University of Illinois at Chicago, Chicago, IL 60607, **Shuming Sun** (sun@math.vt.edu), Department of Mathematics, Virginia Polytechnic Institute and State Univ, VA, and **Bingyu Zhang** (bzhang@math.uc.edu), Department of Mathematics, University of Cincinnati, Cincinnati, OH. *Comparison of Quarter-plane and Two-point Boundary Value Problems: The BBM-equation.* Preliminary report.

Considered here are the quarter-plane problem for the BBM-equation

$$\left.\begin{array}{ll} u_t + u_x + uu_x - u_{xxt} = 0, & x \geq 0, \quad t > 0, \\ u(0,t) = g(t), & t \geq 0, \\ u(x,0) = 0, & x \geq 0 \end{array}\right\} \tag{1}$$

and the same equation with two-point boundary values

$$\left.\begin{array}{ll} v_t + v_x + vv_x - v_{xxt} = 0, & 0 \leq x \leq L, \quad t > 0, \\ v(0,t) = g(t),\ v(L,t) = 0, & t \geq 0, \\ v(x,0) = 0, & 0 \leq x \leq L. \end{array}\right\} \tag{2}$$

Suppose the following compatible conditions

$$u(0,0) = v(0,0) = g(0) = 0$$

hold true. The main result is that if $g \in H^1(\mathbb{R}^+)$, then both problems are well posed in $C^\infty(\mathbb{R}^+)$ globally in time, and for any fixed point $(x,t) \in \mathbb{R}^+ \times \mathbb{R}^+$, $\lim_{L\to\infty} v(x,t) = u(x,t)$. (Received August 31, 2004)