

1056-35-1100

Netra P. Khanal* (netra.khanal@uwc.edu), 614 Oakfield St., apt 3, West Bend, WI 53090,
Jiahong Wu (jiahong@math.okstate.edu), 401 Math Sciences, Department of Mathematics,
Oklahoma State University, Stillwater, OK 74078, and **Juan-Ming Yuan** (jmyuan@pu.edu.tw).
The Kawahara equation in weighted Sobolev spaces.

The initial- and boundary-value problem for the Kawahara equation, a fifth-order KdV type equation, is studied in weighted Sobolev spaces. This functional framework is based on the dual-Petrov–Galerkin algorithm, a numerical method proposed by Shen (2003 SIAM J. Numer. Anal. 41 1595–619) to solve third and higher odd-order partial differential equations. The theory presented here includes the existence and uniqueness of a local mild solution and of a global strong solution in these weighted spaces. If the L2-norm of the initial data is sufficiently small, these solutions decay exponentially in time. Numerical computations are performed to complement the theory. (Received September 20, 2009)