1025-35-202 **Muhammad Usman** and **Bingyu Zhang*** (bzhang@math.uc.edu), Department of mathematical Sciences, University of Cincinnati, Cincinnati, OH 45221. *Forced Oscillations of a Class of Nonlinear Dispersive Wave Equations and Their Stability.* Preliminary report.

It has been observed in laboratory experiments that when nonlinear dispersive waves are forced periodically from one end of undisturbed stretch of the medium of propagation, the signal eventually becomes temporally periodic at each spatial point. The observation has been confirmed mathematically in the context of the damped Kortewg-de Vries (KdV) equation and the damped Benjamin-Bona-Mahony (BBM) equation. In this talk we intend to show the same results hold for the pure KdV equation (without the damping terms) posed on a finite domain. Consideration is given to the initial-boundary-value problem

$$\begin{cases} u_t + u_x + uu_x + u_{xxx} = 0, \quad u(x,0) = \phi(x), \qquad 0 < x < 1,\ t > 0, \\ \\ u(0,t) = h(t), \qquad u(1,t) = 0, \qquad u_x(1,t) = 0, \quad t > 0. \end{cases} \tag{$*$}$$

Viewing $(*)$ (without the initial condition) as an infinite-dimensional dynamical system in the Hilbert space $L^2(0,1)$, we demonstrate that for a given periodic boundary forcing with small amplitude, the system $(*)$ admits a (locally) unique *limit cycle*, or *forced oscillation*, which is locally exponentially stable. (Received January 22, 2007)