1016-03-149 **Hongqiu CHEN*** (hchen1@memphis.edu), Hongqiu CHEN, Department of Mathematical Sciences, University of Memphis, Memphis, TN 38152. *Existence and Stability of Cnoidal Waves of Nonlinear Dispersive Wave Equations.*

A general class of nonlinear dispersive wave equations of the form

$$u_t - Lu_x + f(u)_x = 0, \quad x \in \mathbb{R},\, t \geq 0$$

was derived to describe long-crested waves with small amplitude propagating in one direction. Here, f is a nonlinear function, typically, a polynomial and L is the dispersion operator defined through its Fourier symbol α, say. Thus, L and α are related by the relation

$$\widehat{Lv}(\xi,t) = \alpha(2\pi\xi)\widehat{v}(\xi,t) \quad \text{where} \quad \widehat{v}(\xi,t) = \int_{-\infty}^{\infty} v(x,t)e^{-2\pi i\xi x}\,dx$$

for all wavenumbers ξ. The symbol α is taken to be a real, even continuous function vanishing at the origin and becoming unbounded as $\xi \to \pm\infty$. Theory on existence of periodic traveling wave solutions, the analog of the classical cnoidal waves, and their stability is established. Progress is also made on the question of the large wavelength limit of these periodic wave trains. (Received February 09, 2006)