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**Yi Li\*** ([yili@cs.stevens.edu](mailto:yili@cs.stevens.edu)), Department of Mathematics, Stevens institute of Technology, Hoboken, NJ 07030. *Nonlinear dispersive approximation to the water wave problem*. Preliminary report.

We investigate the nonlinear dispersive effect of the Green-Naghdi (GN) equations as second order approximations to the full water wave problem. Using the Hamiltonian structure of the GN system and comparison methods, we show that the GN system possesses some solutions that remain in a neighborhood of certain bounded, oscillating functions. This fact demonstrates the the nonlinear dispersion effect of the GN system on the existence of global solutions as a contrast to the dispersionless, first order shallow water approximations. (Received February 15, 2006)