1003-65-894 **Azmy Ackleh**, **Keng Deng** and **Shuhua Hu*** (sxh5554@louisiana.edu), P.O.Box 40902, Lafayette, LA 70504. *A Quasilinear Hierarchical Size Structured Model: Well-Posedness and Approximation.*

A finite difference approximation to a hierarchical size-structured model with nonlinear growth, mortality and reproduction rates is developed. Existence-uniqueness of the weak solution to the model is established and convergence of the finite difference approximation is proved. Simulations indicate that the monotonicity assumption on the growth rate is crucial for the global existence of weak solutions. Numerical results testing the efficiency of this method in approximating the long-time behavior of the model are presented. (Received September 30, 2004)