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Vinodh kumar Chellamuthu* (vxc1794@louisiana.edu), Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504, and **Azmy S. Ackleh** and **Kazufumi Ito**. *Finite difference approximations for measure-valued solutions of a hierarchically size-structured population model.*

We consider a quasilinear hierarchically size-structured population model formulated by Ackleh and Ito in 2005. In this model the growth, mortality and reproduction rates are assumed to depend on a function of the population density. The solution to this model can become singular (measure-valued) in finite time even if all the vital rates are smooth. In this paper we develop an implicit first-order finite difference scheme to compute the measure-valued model solution. Convergence analysis for this method is provided. We also present a high resolution second order explicit scheme to compute the solution of the model. Numerical simulations indicate that the second order method is superior in resolving solution-singularities. (Received September 14, 2014)