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Hailiang Liu and **Hui Yu*** (legendyu@iastate.edu). *ENTROPY/ENERGY STABLE SCHEMES FOR EVOLUTIONARY DISPERSAL EQUATIONS*. Preliminary report.

We propose entropy/energy stable finite difference schemes for the scalar reaction-diffusion-advection equation arising in population dynamics of biological dispersal. The peculiar feature of these active dispersal models is that the transient solution converges to the stable steady state when time goes to infinity. For the numerical method to capture the long-time pattern of persistence or extinction, we introduce a concept of entropy when the resource potential is logarithmic, and explore the usual energy for other resource potentials. The present schemes are shown to satisfy three important properties of the continuous model for the population density: i) positivity preserving; (ii) equilibrium preserving; and iii) entropy or energy satisfying. These ensure that our schemes provide a satisfying long-time behavior, thus revealing the desired dispersal pattern. Moreover, we present several numerical results which confirm the second-order accuracy for various resource potentials and underline the efficiency to preserve the large-time asymptotic. (Received February 14, 2012)