1135-35-2272 **Feng Rao*** (raofeng2002@163.com) and **Yun Kang** (yun.kang@asu.edu). *The complex dynamics of a diffusive prey-predator model with an allee effect in prey.* Preliminary report.

This paper investigates complex dynamics of a predator–prey interaction model that incorporates: (a) An Allee effect in prey; (b) the Michaelis-Menten type functional response between prey and predator; and (c) Diffusion in both species. We provide rigorous mathematical results of the proposed model including: 1) the stability of non-negative constant steady states; 2) sufficient conditions that lead to Hopf/Turing bifurcations; 3) a prior estimates of positive steady states; 4) the non-existence and existence of non-constant positive steady states when the model is under zero-flux boundary condition. We also perform completed analysis of the corresponding ODE model to obtain a better understanding on effects of diffusion on the stability. Our analytical results show that the small values of the ratio of the prey's diffusion rate to the predator 's diffusion rate are more likely to destabilize the system, thus generate Hopf-bifurcation and turing instability that can lead to different spatial patterns. Through numerical simulations, we observe that our model, with or without Allee effect, can exhibit extremely rich pattern formations that include but not limit to strips, spotted patterns, symmetric patterns. (Received September 25, 2017)