SHAPE EFFECTS ON HERD BEHAVIOR IN ECOLOGICAL INTERACTING POPULATION MODELS

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ABSTRACT. In this work we consider a modified predator-prey mathematical model. We study an elaborate social model, in which the individuals of the prey population gather together in herds, while the other ones shows a more individualistic bahavior. We model the fact that interactions among the two occure mainly through the perimeter, in a $2D$ space, and through the total area, in a $3D$ space, of the herd. The existence of Hopf bifurcations is shown, which is a distinctive feature of this model in comparison with other classical population models of the same nature. The model's behavior can be summerize introducing a new treshold parameter, defined in terms of the original model parameters.

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