**Discussion of the results**

The results obtained in the above section where there is no predator end up in a stable equilibrium except the case where the friction is removed. This is clearly not a realistic result of swarming behaviour which makes the model useless for swarming behaviour without predators.

In the case of a single predator there are several configurations which lead to a more realistic behaviour of the swarm. Nevertheless the parameters have to be chosen careful. The change of just one a parameter can result in an unrealistic behaviour of the swarm for example to fast moving agents. Further there exist some configurations which end up in a periodic movement of all agents which also is not realistic behaviour. If the parameters are chosen carefully the simulations lead to a realistic and contiguous movement of the agents. On the other hand there are several configurations which lead to a contiguous movement of the agents and behaviours which approximately simulate a realistic swarm attacked by a predator.

With multiple predators there need to be considered three subcases, which differs in the forces between the predators. The difference between the simulations with no force and with attractive force is small. The most remarkable difference is that the predators in the attractive force model do not come as close as in the model with no force. This follows form the repulsive force in the attractive case, when predators are too close by each other.

Predators with a repulsive force between each other result in a simulation which differ the most from the other cases with multiple predators. Here the predators normally surround the swarm of preys and rush into several times. This behaviour is probably caused of the repulsive force between predators, which cause them keeping distance from each other and on the other hand they are attracted by preys.