From Cannibalism to Active Motion of Groups

PAWEL ROMANCUZUK, LUTZ SCHIMANSKY-GEIER, Institute of Physics, Humboldt University Berlin — The detailed mechanisms leading to collective dynamics in groups of animals and insect are still poorly understood. A recent study by Simpson et. al. suggests cannibalism as a driving mechanism for coordinated migration of mormon crickets [1]. Based on this result we propose a simple generic model of brownian particles interacting by asymmetric, non-conservative collisions accounting for cannibalistic behavior and the corresponding avoidance strategy. We discuss our model in one and two dimensions and show that a certain type of collisions drives the system out of equilibrium and leads to coordinated active motion of groups.