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From Cannibalism to Active Motion of Groups PAWEL ROMANCZUK, 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.
[1] Stephen J. Simpson, Gregory A. Sword, Patrick D. Lorch and Iain D. Couzin: *Cannibal crickets on a forced march for protein and salt*, PNAS, 103:4152-4156, 2006

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