

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Linear response to leadership, effective temperature and decision making in flocks.** DANIEL PEARCE, LUCA GIOMI, Univ of Leiden — The Vicsek model is the prototypical system for studying collective behavior of interacting self propelled particles (SPPs). It has formed the basis for models explaining the collective behavior of many active systems including flocks of birds and swarms of insects. To the standard Vicsek model we introduce a small angular torque to a subset of the particles and observe how this effects the direction of polarisation of the entire swarm. This is analogous to a few informed birds trying to lead the rest of a large flock by initiating a turn. We find a linear response to this perturbation and fluctuations that are in agreement with fluctuation dissipation theorem. This allows the identification of an effective temperature for the Vicsek model that follows a power law with the noise amplitude. The linear response can also be extended to the process of decision-making, wherein flocks must decide between the behaviors of two competing subgroups of individuals.

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Date submitted: 06 Nov 2015

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