1135-35-1159   **Eitan Tadmor*** (`tadmor@cscamm.umd.edu`), CSCAMM, CSIC Bldg 406, University of Maryland, Paint Branch Drive, University of Maryland, College Park, MD 20742. *Regularity and emergence of flocking in PDE models with a commutator structure.*

We discuss the question of global regularity for a general class of Eulerian dynamics driven by a forcing with a commutator structure. The study of such systems is motivated by the hydrodynamic description of agent-based models for flocking driven by alignment. For commutators involving bounded kernels, existence of strong solutions follows for initial data which are sub-critical, namely – the initial divergence is "not too negative" and the initial spectral gap is "not too large". Singular kernels, corresponding to fractional Laplacian of order $0<s<1$, behave better: global regularity persists and flocking follows. Singularity helps! (Received September 20, 2017)