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Macroscopic limits of a model of alignment

The macroscopic limits of the kinetic model for interacting entities are studied. The kinetic model is one–dimensional and entities are characterized by their position and orientation (+/-) with swarming interaction controlled by the sensitivity parameter. The macroscopic limits of the model are considered for solutions close either to the diffusive (isotropic) or to the aligned (swarming) equilibrium states for various sensitivity parameters. In the former case the classical linear diffusion equation results whereas in the latter a traveling wave solution does both in the zeroth ("Euler") and first ("Navier–Stokes") order of approximation.