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Michael Raghieb* (mraghib@br.ibm.com), IBM Research, 138 Avenida Pasteur, Botafogo, Rio de Janeiro, RJ 22290-240, Brazil. *Nonlocal in time diffusions as effective models of collective motion in animal groups.*

We propose a (time) multiscale method for the coarse-grained analysis of collective motion and decision-making in self-propelled particle models of swarms comprising a mixture of ‘naïve’ and ‘informed’ individuals. The method is based on projecting the particle configuration onto a single ‘meta-particle’ that consists of the elongation of the flock together with the mean group velocity and position. We find that the collective states can be associated with the transient and asymptotic transport properties of the random walk followed by the meta-particle, which we assume follows a continuous time random walk (CTRW). These properties can be accurately predicted at the macroscopic level by an advection–diffusion equation with memory (ADEM) whose parameters are obtained from a mean group velocity time series obtained from a single simulation run of the individual-based model. (Received August 11, 2015)