ESPCI
Laboratoire PMMH
10 rue Vauquelin, 75231 Paris Cedex 05

Séminaire PMMH

Bureau d'Études, Bâtiment L, 2 ème étage

Vendredi 5 février 2016, 11h00-12h00

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Phase diagram of a data-driven fish school model

After some generalities concerning "intelligent" active matter ("social" vs physical "forces", effect of anisotropic sensorial stimuli, additivity of "forces"...), and in particular fish schools, I will present a series of experiments performed in Guy Theraulaz' group at the CRCA in Toulouse, and a class of models directly inspired by them which can equally describe fish displaying smooth/continuous velocities or burst and coast swimming behavior. I will present a comparison between experiments and models in both case. In the absence of confining boundaries, the phase diagram of the model reproduces three commonly observed collective phases (swarming, schooling, milling), as well as a less common, but yet observed, extremely elongated phase. In addition, a procedure is defined and applied in order to directly measure the actual functional form of the fish-wall and wall-wall interactions.