

INTERACTIONS OF FLOCKING PARTICLES WITH THE INCOMPRESSIBLE FLUID

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ABSTRACT. We present the global existence of weak solutions to the Cucker-Smale-Stokes system in a infinitely long cylindrical domain with the specular boundary condition. The proposed system consists of the kinetic Cucker-Smale model and the Stokes system for flocking particles and an incompressible fluid, respectively, in an infinitely long cylindrical domain. It models the collective dynamics resulting from the fluid-particle-structure interactions. For this model, we provide the global existence of a weak solution, and numerical simulations which exhibits collective behaviors of flocking particles.

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