

PROPAGATION OF CHAOS FOR SOME 2 DIMENSIONAL FRACTIONAL KELLER SEGEL EQUATION IN DOMINATED DIFFUSION AND FAIR COMPETITION CASES

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ABSTRACT. In this work we deal with the local in time propagation of chaos without cut-off for some two dimensional fractional Keller Segel models. More precisely the diffusion considered here is given by the fractional Laplacian operator $-(-\Delta)^{\frac{a}{2}}$ with $a \in (1, 2)$ and the singularity of the interaction is of order $|x|^{1-\alpha}$ with $\alpha \in]1, a[$. In the case $\alpha \in (1, a)$ we prove a complete propagation of chaos result, proving the Γ -l.s.c property of the fractional Fisher information, already known for the classical Fisher information, using a result of [4]. In the fair competition case ([1]) $a = \alpha$, we only prove a convergence/consistency result in a sub-critical mass regime, similarly as the result obtained for the classical Keller-Segel equation in [2].

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