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Nonlinear Fokker-Planck equations with nonlocalities and reaction as gradient flows

We interpret a class of nonlinear Fokker-Planck equations [1] with reaction as gradient flows over the spaces of Radon and probability measures equipped with the recently introduced Hellinger-Kantorovich distance [2-4] and the spherical Hellinger-Kantorovich distance [5], resp. The latter ones have nonlocal terms which appear as Lagrange multipliers due to conservation of the mass. We prove new isoperimetric-type functional inequalities, which allow us to control the relative entropy by its production. This yields exponential convergence of the trajectories to the equilibrium.

Based on a joint work with S. Kondratyev.

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4. L. Chizat et al. An Interpolating Distance Between Optimal Transport and Fisher-Rao Metrics, to appear in Found. Comp. Math.

5. A. Mielke and V. Laschos. Geometric properties of cones with applications on the Hellinger-Kantorovich space, and a new distance on the space of probability measures, preprint.