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Aggregation with intrinsic interactions on Riemannian manifolds

We consider a model for collective behaviour with intrinsic interactions on Riemannian manifolds. We establish the well-posedness of measure solutions, defined via optimal mass transport, on several specific manifolds (sphere, hypercylinder, rotation group SO(3)), and investigate the mean-field particle approximation. We study the long-time behaviour of solutions, where the primary goal is to establish sufficient conditions for a consensus state to form asymptotically. The analytical results are illustrated with numerical experiments that exhibit various asymptotic patterns.