

Failure of the curvature-dimension condition in sub-Finsler manifolds

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The Lott–Sturm–Villani curvature-dimension condition $CD(K,N)$ provides a synthetic notion for a metric measure space to have curvature bounded from below by K and dimension bounded from above by N . It has been recently proved that this condition does not hold in any sub-Riemannian manifold equipped with a positive smooth measure, for every choice of the parameters K and N . In this talk, we investigate the validity of the analogous result for sub-Finsler manifolds, providing two results in this direction. On the one hand, we show that the CD condition fails in sub-Finsler manifolds equipped with a smooth strongly convex norm and with a positive smooth measure. On the other hand, we prove that, for the sub-Finsler Heisenberg group, the same result holds for every reference norm. Additionally, we show that the validity of the measure contraction property $MCP(K,N)$ on the sub-Finsler Heisenberg group depends on the regularity of the reference norm.

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