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*On infinitesimal versions of Log-Brunn-Minkowski and related inequalities*

Log-Brunn-Minkowski conjecture was proposed by K.J. Boroczky, E. Lutwak, D. Yang and G. Zhang, and it suggests a strengthening of the classical Brunn-Minkowski inequality in the case of symmetric convex sets.

We determine the infinitesimal version of the log-Brunn-Minkowski inequality. As a consequence, we obtain a strong Poincaré-type inequality in the case of unconditional convex sets, as well as symmetric convex sets on the plane.

Using it, we establish the validity of the log-Brunn-Minkowski inequality for any pair of symmetric convex sets which are close enough to a Euclidean ball of any radius. We also establish the validity of dimensional Brunn-Minkowski inequality for any pair of (not necessarily symmetric) convex sets near a ball, with respect to a rotation invariant log-concave measure.