

# $L_p$ BRUNN-MINKOWSKI TYPE INEQUALITIES UNDER PROJECTION CONSTRAINTS

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In the classical Brunn-Minkowski theory, if the convex bodies  $K, L$  are assumed to share a common projection onto a hyperplane, namely  $P_{u^\perp}(K) = P_{u^\perp}(L)$ , for some direction  $u$ , then the Brunn-Minkowski inequality admits the following improvement:

$$\mathrm{vol}_n((1 - \lambda)K + \lambda L) \geq (1 - \lambda)\mathrm{vol}_n(K) + \lambda\mathrm{vol}_n(L),$$

for every  $\lambda \in [0, 1]$ . For  $p \geq 1$ , the  $L_p$  Brunn-Minkowski inequality establishes

$$\mathrm{vol}_n((1 - \lambda)K + \lambda L)^{p/n} \geq (1 - \lambda)\mathrm{vol}_n(K)^{p/n} + \lambda\mathrm{vol}_n(L)^{p/n},$$

for every  $\lambda \in [0, 1]$  and convex bodies  $K$  and  $L$  containing the origin.

In this talk, we will discuss possible improvements for the  $L_p$  Brunn-Minkowski inequality when the convex bodies share a common projection, and some recent results in this direction.