

INEQUALITIES FOR DUAL QUERMASSINTEGRALS OF THE p -CROSS-SECTION BODIES

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Abstract. Gardner and Giannopoulos defined the p -cross-section body $C_p K$ ($p > -1$) of convex body K in Euclidean space \mathbb{E}^n . In this paper, we obtain inequalities for dual quermassintegrals of the p -cross-section body $C_p K$. Further, two monotonic inequalities concerning the $C_p K$ are given.

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REFERENCES

- [1] U. BREHM, *Convex bodies with nonconvex cross-section bodies*, Mathematika **46**, 1 (1999), 127–129.
- [2] W. J. FIREY, *p -means of convex bodies*, Math Scand. **10** (1962), 17–24.
- [3] R. J. GARDNER, *Geometric Tomography*, Second ed., Cambridge Univ. Press, Cambridge, 2006.
- [4] R. J. GARDNER AND A. A. GIANNOPoulos, *p -cross-section bodies*, Indiana U. Math. J. **48** (1999), 593–613.
- [5] R. J. GARDNER AND G. Y. ZHANG, *Affine inequalities and radial mean bodies*, Amer. J. Math. **120** (1998), 505–528.
- [6] E. GRINBERG AND G. Y. ZHANG, *Convolutions, transforms, and convex bodies*, Proc. London Math. Soc. **78** (1999), 77–115.
- [7] C. HABERL, *L_p intersection bodies*, Adv. Math. **217** (2008), 2599–2624.
- [8] C. HABERL AND M. LUDWIG, *A characterization of L_p intersection bodies*, International Mathematics Research Notices (Int. Math. Res. Not.), 2006, Art ID 10548, 29 pages.
- [9] C. HABERL AND F. SCHUSTER, *General L_p affine isoperimetric inequalities*, J. Differential Geom. **83** (2009), 1–26.
- [10] G. H. HARDY, J. E. LITTLEWOOD AND G. PÓLYA, *Inequalities*, Cambridge University Press, Cambridge, 1959.
- [11] E. LUTWAK, *Dual mixed volumes*, Pacific J. Math. **58** (1975), 531–538.
- [12] E. LUTWAK, *The Brunn-Minkowski-Firey theory I: mixed volumes and the minkowski problem*, J. Differential Geom. **38** (1993), 131–150.
- [13] E. LUTWAK, *The Brunn-Minkowski-Firey theory II: affine and geometric minimal surface areas*, Adv. Math. **118** (1996), 244–294.
- [14] E. LUTWAK, D. YANG AND G. Y. ZHANG, *L_p affine isoperimetric inequalities*, J. Differential Geom. **56** (2000), 111–132.
- [15] E. LUTWAK, D. YANG AND G. Y. ZHANG, *Sharp affine L_p Sobolev inequalities*, J. Differential Geom. **52** (2002), 17–38.
- [16] E. LUTWAK, D. YANG AND G. Y. ZHANG, *On the L_p -Minkowski problem*, Trans. Amer. Math. Soc. **356** (2004), 4359–4370.
- [17] E. LUTWAK, D. YANG AND G. Y. ZHANG, *L_p John ellipsoids*, Proc. London Math. Soc. **90** (2005), 497–520.
- [18] E. LUTWAK, D. YANG AND G. Y. ZHANG, *Volume inequalities for subspace of L_p* , J. Differential Geom. **68** (2004), 159–184.
- [19] E. LUTWAK AND G. Y. ZHANG, *Blaschke-Santaló inequalities*, J. Differential Geom. **47** (1997), 1–16.

- [20] T. Y. MA AND W. D. WANG, *On the analog of Shephard problem for the L_p -projection body*, Math. Ineq. Appl. **14** (2011), 181–192.
- [21] M. MEYER, *Maximal hyperplane sections of convex bodies*, Mathematika **46**, 1 (1999), 131–136.
- [22] R. SCHNEIDER, *Convex Bodies: The Brunn-Minkowski Theory*, Cambridge Univ. Press, Cambridge, Second Expanded Edition, 2014.
- [23] W. WANG AND B. W. HE, *L_p -dual affine surface area*, J. Math. Anal. Appl. **348** (2008), 746–751.
- [24] W. WANG AND B. W. HE, *Inequalities for L_p -dual affine surface area*, Math. Ineq. Appl. **13** (2010), 319–327.
- [25] W. D. WANG AND G. S. LENG, *L_p -dual mixed quermassintegrals*, Indian J. Pure Appl. Math. **36** (2005), 177–188.
- [26] W. D. WANG, F. H. LU AND G. S. LENG, *A type of monotonicity on the L_p centroid body and L_p projection body*, Math. Ineq. Appl. **8** (2005), 735–742.
- [27] W. D. WANG AND C. QI, *L_p -dual geominimal surface area*, J. Inequal. Appl. **2011**, 6 (2011), 10 pages.
- [28] W. D. WANG AND Y. P. ZHOU, *Inequalities for the p -cross-section bodies*, Math. Ineq. Appl. **17**, 3 (2014), 1005–1013.
- [29] E. WERNER AND D. YE, *New L_p -affine isoperimetric inequalities*, Adv. Math. **218** (2008), 762–780.
- [30] J. YUAN AND C. W. SUM, *L_p -intersection bodies*, J. Math. Anal. Appl. **339** (2008), 1431–1439.