

## ON THE RATIO BETWEEN SUCCESSIVE RADI OF A SYMMETRIC CONVEX BODY

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*Abstract.* In this note we study the upper bound for the ratio between the so called successive inner and outer radii of a 0-symmetric convex body  $K$ . This problem was studied by Perel'man and Pukhov and it is a natural generalization of the classical results of Jung and Steinhagen.

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### REFERENCES

- [1] U. BETKE, M. HENK, *Estimating sizes of a convex body by successive diameters and widths*, *Mathematika* **39**, 2 (1992), 247–257.
- [2] U. BETKE, M. HENK, *A generalization of Steinhagen's theorem*, *Abh. Math. Sem. Univ. Hamburg* **63** (1993), 165–176.
- [3] T. BONNESEN AND W. FENCHEL, *Theorie der konvexen Körper*, Springer, Berlin, 1934, 1974. English translation: *Theory of convex bodies*. Edited by L. Boron, C. Christenson and B. Smith. BCS Associates, Moscow, ID, 1987.
- [4] R. BRANDENBERG, *Radii of regular polytopes*, *Discrete Comput. Geom.* **33**, 1 (2005), 43–55.
- [5] R. BRANDENBERG, T. THEOBALD, *Radii minimal projections of polytopes and constrained optimization of symmetric polynomials*, *Adv. Geom.* **6**, 1 (2006), 71–83.
- [6] P. GRITZMANN, V. KLEE, *Inner and outer  $j$ -radii of convex bodies in finite-dimensional normed spaces*, *Discrete Comput. Geom.* **7** (1992), 255–280.
- [7] M. HENK, *A generalization of Jung's theorem*, *Geom. Dedicata* **42** (1992), 235–240.
- [8] M. HENK, M. A. HERNÁNDEZ CIFRE, *Intrinsic volumes and successive radii*, *J. Math. Anal. Appl.* **343**, 2 (2008), 733–742.
- [9] M. HENK, M. A. HERNÁNDEZ CIFRE, *Successive minima and radii*, *Canad. Math. Bull.* **52**, 3 (2009), 380–387.
- [10] G. YA. PEREL'MAN, *On the  $k$ -radii of a convex body*, (Russian) *Sibirsk. Mat. Zh.* **28**, 4 (1987), 185–186. English translation: *Siberian Math. J.* **28**, 4 (1987), 665–666.
- [11] S. V. PUKHOV, *Inequalities for the Kolmogorov and Bernštejn widths in Hilbert space*, (Russian) *Mat. Zametki* **25**, 4 (1979), 619–628, 637. English translation: *Math. Notes* **25**, 4 (1979), 320–326.