

On local Liakopoulos-Meyer type inequalities

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Resumen. Given $K \subseteq \mathbb{R}^n$, a convex body (a convex and compact set with non-empty interior), we can bound its volume by the volume of the box whose edges have lengths equal to the volumes of the projections of K onto the coordinate axes. Using this idea, in 1949, Loomis and Whitney [5] proved, by approximating sets with boxes, that

$$|K|^{n-1} \leq \prod_{i=1}^n |P_{e_i^\perp} K|$$

where $|\cdot|$ denotes volume, and $P_{e_i^\perp} K$ denotes the projection of K onto $\langle e_i \rangle^\perp$. Later, Bollobás and Thomason [2] generalized the previous result to the volumes of projections of convex bodies onto other subspaces. Dual results proved by Meyer [6] and Liakopoulos [4] provide lower bounds for the volume of K , in which projections are replaced by sections.

Local results of this type were introduced systematically in 2018 by Brazitikos et al. [3] and the corresponding ones for projections were completely solved by Alonso-Gutiérrez et al. [1]. The aim of this talk is to present the optimal solution in some cases to the local inequalities for sections and its functional versions.

Palabras clave: volume; convex body; log-concave function; section; projection.

Referencias

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