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Two optimization problems for convex bodies in the n-dimensional space. (English)

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The paper gives upper estimates of the volume and the surface area of n-dimensional convex bodies with given diameter d and minimal width ω. The estimates are attained for the symmetric slice $S(\omega, d)$ of the ball of diameter d bounded by two parallel hyperplanes at distance apart ω. As a corollary, the volume and the surface area of n-dimensional convex bodies with given circumradius R and minimal width ω are estimated from above. These estimates are attained for the slice $S(\omega, 2R)$.

Reviewer: Marek Lassak (Bydgoszcz)

MSC:

52A40 Inequalities and extremum problems involving convexity in convex geometry
52A20 Convex sets in n dimensions (including convex hypersurfaces)
52A38 Length, area, volume and convex sets (aspects of convex geometry)

Keywords:

convex body; volume; surface area; minimal width; diameter; circumradius; inradius

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