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Convex Hypersurfaces with Hyperplanar Intersections of Their Homothetic Copies

Extending a well-known characteristic property of ellipsoids, we describe all convex solids $K \subset \mathbb{R}^n$, possibly unbounded, with the following property: for any vector $z \in \mathbb{R}^n$ and any scalar $\lambda \neq 0$ such that $K \neq z + \lambda K$, the intersection of the boundaries of K and $z + \lambda K$ lies in a hyperplane. This property is related to hyperplanarity of shadow-boundaries of K and central symmetricity of small 2-dimensional sections of K.

Keywords: Besicovitch, body, convex, ellipse, ellipsoid, convex, quadric, section, shadow-boundary, solid.

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