F. Pereira, Fátima
A directional curvature formula for convex bodies in $\mathbb{R}^n$. (English) [Zbl 07413099]

Summary: Given a compact convex set $F$ in $\mathbb{R}^n$, with the origin in its interior, and a point on its boundary, near which it is given by an implicit equation, we present a formula to compute the curvature in the direction of any tangent vector. For this, we consider the intersection curve between the boundary of $F$ and a suitable plane, but without using the plane equations or the curve expression. Furthermore, we see that, when we use the equations of the plane and the equation that define the boundary of $F$ near the fixed point, the formula that we obtain is equivalent to the existing ones, but it is easier to apply.

MSC:
52A20 Convex sets in $n$ dimensions (including convex hypersurfaces)
49Nxx Miscellaneous topics in calculus of variations and optimal control
53Axx Classical differential geometry

Keywords:
convex set; curvature; implicit function theorem; tangent vector

References:

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