Journal of Convex Analysis 33 (2026) 1061–1076

A. Seeger
Département de Mathématiques, Université d'Avignon, Avignon, France
aseegerfrance@gmail.com

M. Torki
LMA, Université d'Avignon, Avignon, France
mounir.torki@univ-avignon.fr

On Convex Cones for which Criticality Coincides with Antipodality

Let K be a proper cone in a Euclidean space E. An antipodal pair of K is a pair of unit vectors in K that achieves the maximum angle $\theta_{\max}(K)$ of the cone. A critical pair of K is a pair of unit vectors in K that satisfies the Karush-Kuhn-Tucker optimality conditions of the nonconvex optimization problem defining $\theta_{\max}(K)$. Antipodality implies criticality, but not conversely. This work studies the class of proper cones for which antipodality and criticality coincide.

Keywords: Convex cone, maximal angle, critical angle, antipodal pair, opening angle function, diametric completeness, antipodal mate property.

MSC: 52A20, 52A40.