

Minimizing a quadratic function quadratically constrained on the sphere

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Abstract

The classical convex (homogeneous) Brickman theorem establishes the convexity of the image of the sphere via a pair of quadratic forms. We characterize the convexity when any pair of quadratic functions is considered. This is carried out by establishing that such a set is simply connected and then analyze its convexity. Applications are given to present an extension of Polyak theorem in the same direction, and a characterization of zero duality.

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