

A NOTE ON p^λ -CONVEX SETS IN A COMPLETE RIEMANNIAN MANIFOLD

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Abstract

In this paper we have generalized the notion of λ -radial contraction in a complete Riemannian manifold and developed the concept of p^λ -convex functions. We have also given a counter example proving the fact that in general λ -radial contraction of a geodesic is not necessarily a geodesic. We have also deduced some relations between geodesic convex sets and p^λ -convex sets and showed that under certain condition they are equivalent.

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Key words: λ -radial contraction, p^λ -convex, Riemannian manifold.

1 Introduction

The notion of convexity is a basic topic of modern mathematics, especially, in optimization theory and linear programming. But only convexity is not sufficient to study the behavior of a set. Hence there are many generalization of convexity not only in Euclidean space but also in manifold. Some related work on this topic can be found in [3, 4, 5, 6].

In 2010 Beltagy and Shenawy [1] defined the notion of λ -radial contraction in Euclidean space and proved that under such a contraction a line remains invariant. In this paper we have defined λ -radial contraction in a complete Riemannian manifold and showed that, in general, λ -radial contraction of a geodesic need not be a geodesic. In fact convexity property of a subset in a Riemannian manifold is not invariant under the λ -radial contraction and hence a new type of convexity is

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