Geometry,
Integrability
and
Quantization (XXII)

ON THE GEOMETRY OF SUBMERSIONS

ABDIGAPPAR NARMANOV and XURSHID SHARIPOV

Department of Mathematics, National University of Uzbekistan
100174 Tashkent, Uzbekistan

Abstract. Subject of present paper is the geometry of foliation defined by submersions on complete Riemannian manifold. It is proven foliation defined by Riemannian submersion on the complete manifold of zero sectional curvature is total geodesic foliation with isometric leaves. Also it is shown level surfaces of metric function are conformally equivalent.

MSC: 57R30, 58A10
Keywords: Foliation of codimension one, metric function, Riemannian submersion

1. Introduction

Differentiable mappings of maximal rank play an important role in all branches of mathematics, in particular in Riemannian geometry. One of the important classes of differentiable mappings of maximal rank consists of immersions. Immersions have been intensively studied since the inception of Riemannian geometry. The geometry of immersed manifolds is a generalization of the classical differential geometry of surfaces in Euclidean space. The differential geometry of isometric immersions and embeddings was well studied and well represented in many textbooks on differential geometry.

The dual concept of submersion was formed relatively recently, in the second half of the twentieth century [2, 14]. The study of the geometry of submersions, in particular the geometry of Riemannian submersions, proved to be very fruitful due to the fact that Riemannian submersions have applications in all sections of modern Riemannian geometry. The study of the geometry of submersions is closely related to the study of the geometry of foliations, which is an important section of modern geometry. Submersion generates a foliation whose leaves are level surfaces of the