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A SCHUR TYPE THEOREM FOR ALMOST COSYMPLECTIC MANIFOLDS WITH KAEHLERIAN LEAVES

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Abstract

In this study, we give a Schur type theorem for almost cosymplectic manifolds with Keahlerian leaves.

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1. Introduction

Let M be a Riemannian manifold with curvature tensor R. The sectional curvature of a 2-plane α in a tangent space T_PM is defined by $K(\alpha, P) = R(X, Y, Y, X)$, where $\{X, Y\}$ is an orthonormal basis of T_PM. The classical theorem of F. Schur says that if M is a connected manifold of dimension $n \geq 3$ and in any point $P \in M$ the curvature $K(\alpha, P)$ does not depend on $\alpha \in T_PM$ then it does not depend on the point P too, i.e. it is a global constant. Such a manifold is called a manifold of constant sectional curvature. The Shur's theorem has been studied by many authors for different structures [11]. In 1989, Nobuhiro improves the Shur's theorem and gets a new version for locally symmetric spaces [10]. In 2001, Kassabov considers connected $2n$-dimensional almost Hermitian manifold M to be of pointwise constant antiholomorphic sectional curvature $\nu(p)$, $p \in M$ and proves that ν is a global constant [6]. In 2006, Cho defines a contact strongly pseudo-convex CR space-form using the Tanaka-Webster connection in a way similar to the Sasakian space form and then he studies the geometry of such spaces. He presents a Schur type theorem for such structures [7]. The notion of an almost cosymplectic manifold was introduced by Goldberg and Yano in 1969, [19]. The simplest examples of such manifolds are those being the products (possibly local) of almost Kaehlerian manifolds and the real line $\mathbb{R}$ or the circle S^1. Curvature properties of almost cosymplectic manifolds were studied mainly by Goldberg and Yano [12], Olszak [13], [14], Kirichenko [15] and Endo [16]. We

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