

ON A SPECIAL WEAKLY PROJECTIVELY SYMMETRIC
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Abstract: The notion of a weakly symmetric and weakly projective symmetric Riemannian manifolds have been introduced and studied by L. Tamassy and T. Q. Binh ([7], [8]). Recently, Singh and Khan [5] introduced the notion of special weakly symmetric Riemannian manifolds and denoted such manifold by $(SWS)_n$. In this paper, I have studied the nature of Ricci tensor R of type $(1, 1)$ in a special weakly projective symmetric Riemannian manifold $(SWPS)_n$ and have investigated some interesting result on $(SWPS)_n$.

Keywords and Phrases: Projective curvature tensor, Ricci tensor, Einstein manifold, Special weakly projective symmetric Riemannian manifold.

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1. Introduction

Let M^n be an n -dimensional Riemannian manifold and $\chi(M)$ denote the set of differentiable vector fields on M^n . Let $K(X, Y, Z)$ be the Riemannian curvature tensor of type $(1, 3)$ for $X, Y, Z \in \chi(M)$. A non-flat Riemannian manifold (M^n, g) , $(n \geq 2)$ is called a special weakly symmetric Riemannian manifold [5], if the curvature tensor K of type $(1, 3)$ satisfies the condition

$$\begin{aligned} (D_X K)(Y, Z, V) &= 2\alpha(X)K(Y, Z, V) + \alpha(Y)K(X, Z, V) + \alpha(Z)K(Y, X, V) \\ &\quad + \alpha(V)K(Y, Z, X), \end{aligned} \tag{1.1}$$

where α is a non-zero 1- form. ρ is associated vector field such that

$$\alpha(X) = g(X, \rho), \tag{1.2}$$