

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  $\alpha$  is a non-zero 1- form.  $\rho$  is associated vector field such that

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