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On $(LCS)_n$ -Manifolds Satisfying Certain Conditions on D-Conformal Curvature Tensor

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ON LCSN-MANIFOLDS SATISFYING CERTAIN CONDITIONS ON D-CONFORMAL CURVATURE TENSOR

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Sunil Yadav [α] & Praduman Kumar Dwivedi [σ]

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I. Introduction

An n -dimensional Lorentzian manifold M is smooth connected para contact Hausdorff manifold with Lorentzian metric g, i.e., M admits a smooth symmetric tensor field g of type $(0,2)$ such that for each point $p \in M$, the tensor $g_p : T_pM \times T_pM \to \Re$ is a non degenerate inner product of signature $(-,+,\ldots..+)$ where T_pM denotes the tangent space of M at p and $\Re$ is the real number space. A non-zero vector $\upsilon \in (T_pM)$ is said to be time like (res., non-space like, null, space like) if it satisfies $g_p(\upsilon,\upsilon) < 0$ (resp., $\le 0, = 0, > 0$) (see [2]).

Definition1.1. In a Lorentzian manifold (M, g) a vector field P defined by

$$g(X, P) = A(X)$$

for any vector field $X \in \chi(M)$ is said to be concircular vector field if

$$(\nabla_X A)(Y) = \alpha\left[g(X,Y) + \omega(X)A(Y)\right]$$

where α is a non zero scalar function, A is a 1-form and ω is a closed 1-form.

Let M^n be a Lorentzian manifold admitting a unit time like concircular vector field ξ, called the characteristic vector field of the manifold. Then we have

(1.1) $$g(\xi,\xi) = -1$$

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Since ξ is the unit concircular vector field, there exist a non zero 1-form η such that

(1.2) $$g(X,\xi)=\eta(X)$$

the equation(1.2) of the following form holds

(1.3) $$(\nabla_X \eta)(Y)=\alpha[g(X,Y)+\eta(X)\eta(Y)] \ (\alpha \neq 0)$$

for all vector field X,Y, where ∇ denotes the operator of covariant differentiation with respect to Lorentzian metric g and α is a non zero scalar function satisfying

(1.4) $$(\nabla_X \alpha)=(X\alpha)=\rho\eta(X),$$

where ρ being a scalar function. If we put

(1.5) $$\phi X=\frac{1}{\alpha}\nabla_X \xi,$$

then from (1.3) and (1.5), we have

(1.6) $$\phi^2 X=X+\eta(X)\xi,$$

from which it follows that ϕ is a symmetric $(1,1)$ -tensor. Thus the Lorentzian manifold M^n together with unit time like concircular vector field ξ, its associate 1-form η and $(1,1)$ –tensor field ϕ is said to be $(LCS)n$ -manifold. Especially, if we take $\alpha=1$, then the manifold becomes LP-Sasakian structure of Matsumoto (see [3]).

The D -conformal curvature tensor B (see [4]), projective curvature tensor P, concircular curvature tensor C (see [5]) on a Riemannian manifold (M^n,g), $(n>4)$ are defined as

(1.7)
$$B(X,Y)Z=R(X,Y)Z+\frac{1}{n-3)}\begin{bmatrix}S(X,Z)Y-S(Y,Z)X+g(X,Z)QY-g(Y,Z)QX-S(X,Z)\eta(Y)\xi\\+S(Y,Z)\eta(X)\xi-\eta(X)\eta(Z)QY+\eta(Y)\eta(Z)QX\end{bmatrix}$$
$$-\frac{(k-2)}{(n-3)}\{g(X,Z)Y-g(Y,Z)X\}+\frac{k}{(n-3)}\begin{Bmatrix}g(X,Z)\eta(Y)\xi-g(Y,Z)\eta(X)\xi\\+\eta(X)\eta(Z)Y-\eta(Y)\eta(Z)X\end{Bmatrix}$$

(1.8) $$P(X,Y)Z=R(X,Y)Z-\frac{1}{(n-1)}\{S(Y,Z)X-S(X,Z)Y\}$$

(1.9) $$C(X,Y)Z=R(X,Y)Z-\frac{r}{n(n-1)}\{g(Y,Z)X-g(X,Z)Y\}$$

respectively, where r is the scalar curvature, Q is the Ricci tensor and $k=\dfrac{(r+2)(n-1)}{(n-2)}$.

Ref.

[3] K.Matsumoto;On Lorentzian almost paracontact manifolds,Bull.Yamagata Univ.Natur.Soci.12(1989),151-156.

II. Preliminaries

A differentiable manifold M of dimension n is called $(LCS)n$ -manifold if it admits a $(1,1)-$ tensor ϕ, a contravarient vector field ξ, a covariant vector field η and a Lorentzian metric g which satisfy the following.

Notes

(2.1) $$\eta(\xi)=-1$$

(2.2) $$\phi^2=I+\eta\otimes\xi$$

(2.3) $$g(\phi X,\phi Y)=g(X,Y)+\eta(X)\eta(Y)$$

(2.4) $$g(X,\xi)=\eta(X)$$

(2.5) $$\phi\xi=0\ ,\qquad \eta(\phi X)=0$$

for all $X,Y\in TM.$ Also in a $(LCS)n$ –manifold the following relations are satisfied (see[4]).

(2.6) $$\eta(R(X,Y)Z)=(\alpha^2-\rho)[g(Y,Z)\eta(X)-g(X,Z)\eta(Y)]$$

(2.7) $$R(X,Y)\xi=(\alpha^2-\rho)[\eta(Y)X-\eta(X)Y]$$

(2.8) $$R(\xi,X)Y=(\alpha^2-\rho)[g(X,Y)\xi-\eta(Y)X]$$

(2.9) $$R(\xi,X)\xi=(\alpha^2-\rho)[\eta(X)\xi+X]$$

(2.10) $$(\nabla_X\phi)(Y)=\alpha[g(X,Y)\xi+2\eta(X)\eta(Y)\xi+\eta(Y)X]$$

(2.11) $$S(X,\xi)=(n-1)(\alpha^2-\rho)\eta(X)$$

(2.12) $$S(\phi X,\phi Y)=S(X,Y)+(n-1)(\alpha^2-\rho)\eta(X)\eta(Y)$$

(2.13) $$(X\rho)=d\rho(X)=\beta\eta(X)$$

Definition.2.1.A Lorentzian concircular structure manifold is said to be $\eta-$Einstein if the Ricci operator Q satisfies

$$Q=aId+b\eta\otimes\xi,$$

where a and b are smooth functions on the manifolds, In particular if $b=0$, then M is an Einstein manifold.

III. Main Results

Theorem 3.1. There is no $(LCS)_n$ - manifold that satisfying $B(X,Y)Z=0.$

Proof. Assume that in a $(LCS)_n$ -manifold

(3.1) $$B(X,Y)Z=0.$$

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Then it is follows from (1.7) and (3.1) that

$$R(X,Y)Z=-\frac{1}{(n-3)}\begin{bmatrix}S(X,Z)Y-S(Y,Z)X+g(X,Z)QY-g(Y,Z)QX\\ -S(X,Z)\eta(Y)\xi+S(Y,Z)\eta(X)\xi-\eta(X)\eta(Z)QY\\ +\eta(Y)\eta(Z)QX\end{bmatrix}$$

(3.2)

$$+\frac{(k-2)}{(n-3)}\{g(X,Z)Y-g(Y,Z)X\}-\frac{k}{(n-3)}\begin{Bmatrix}g(X,Z)\eta(Y)\xi-g(Y,Z)\eta(X)\xi\\ +\eta(X)\eta(Z)Y-\eta(Y)\eta(Z)X\end{Bmatrix}$$

It can also written as

$$g(R(X,Y)Z,U)=-\frac{1}{(n-3)}\begin{bmatrix}S(X,Z)g(Y,U)-S(Y,Z)g(X,U)+g(X,Z)S(Y,U)\\ -g(Y,Z)S(X,U)-S(X,Z)\eta(Y)\eta(U)+S(Y,Z)\eta(X)\eta(U)\\ -\eta(X)\eta(Z)S(Y,U)+\eta(Y)\eta(Z)S(X,U)\end{bmatrix}$$

(3.3)

$$+\frac{(k-2)}{(n-3)}\{g(X,Z)g(Y,U)-g(Y,Z)g(X,U)\}$$

$$-\frac{k}{(n-3)}\begin{Bmatrix}g(X,Z)\eta(Y)\eta(U)-g(Y,Z)\eta(X)\eta(U)\\ +\eta(X)\eta(Z)g(Y,U)-\eta(Y)\eta(Z)g(X,U)\end{Bmatrix}$$

Taking $X=U=\xi$ in (3.3) and using (2.1) (2.4) and (2.11), it becomes

(3.4) $$\left[\frac{(\rho-\alpha^2)(5n+3)+2(k-1)}{(n-3)}\right]\{g(Y,Z)+\eta(Y)\eta(Z)\}=0$$

Then (3.4) implies that

(3.5) $$g(Y,Z)+\eta(Y)\eta(Z)=0.$$

From (3.5) and (2.3) it is seen that $g(\phi Y,\phi Z)=0$, however, as this is not possible.

This proves the theorem3.1.

Theorem3.2. A Ricci D-conformal semi-symmetric $(LCS)_n$-manifold is an Einstein manifold with scalar curvature $r=2n^2(\alpha^2-\rho)$.

Proof. From (1.7) by virtue of (2.6) and (2.11), we obtain

(3.6) $$\eta(B(X,Y)Z=\left[(\alpha^2-\rho)+\frac{(k-2)}{(n-3)}\right]\{g(Y,Z)\ \eta(X)-g(X,Z)\ \eta(Y)\}$$

From (3.6), it follows that

(3.7) $$\eta(R(X,Y)\xi)=0.$$

Notes

and

(3.8) $$\eta(B(\xi,Y)Z = \left[(\alpha^2-\rho)+\frac{(k-2)}{(n-3)}\right]\{-g(Y,Z)-\eta(Y)\eta(Z)\}$$

Assume that M^n is a Lorentzian concircular manifold satisfies the condition

Notes

(3.9) $$B(X,Y)S(Z,W)=0.$$

From (3.9), it is obtained that

(3.10) $$S(B(X,Y)Z,W)+S(Z,B(X,Y)W)=0$$

Taking $X=W=\xi$ in (3.10) and using (3.6) (3.7) (3.8) and (2.11), we get

(3.11) $$S(Y,Z)=2n(\alpha^2-\rho)\,g(Y,Z)$$

This proves the theorem3.2.

Definition 3.1.A Riemannian manifold (M^n,g) is termed as Ricci D-conformal semi-symmetric if $B(X,Y)S=0.$

Theorem3.3. There is no $(LCS)_n$ -manifold that satisfying $R(X,Y)B=0.$

Proof. Assume that in a $(LCS)_n$ -manifold satisfies the conditions $R(\xi,Y)B=0.$, then it is expressed as

(3.12) $$R(X,Y)B(Z,V)W-B(R(X,Y)Z,V)W-B(Z,R(X,Y)V)W-B(Z,V)R(X,Y)W=0$$

for all vector field X,Y,Z,V and W on M^n.

For $X=\xi$, it is follows from (2.8) and (3.12) that

(3.13) $$(\alpha^2-\rho)\begin{bmatrix} B(Z,V,W,Y)-\eta(B(Z,V)W)\eta(Y)-g(Y,Z)\eta(B(\xi,V)W)+\eta(Z)\eta(B(Y,V)W) \\ -g(Y,V)\eta(B(Z,\xi)W)+\eta(V)\eta(B(Z,Y)W)-g(Y,W)\eta(B(Z,V)\xi)+\eta(W)\eta(B(Z,V)Y \end{bmatrix}=0$$

In fact $Y=Z$ in (3.13) and by use of (3.6) (3.7) and (3.8) we have

(3.14) $$(\alpha^2-\rho)\left[B(Z,V,W,Y)-g(Z,Z)\eta(B(\xi,V)W)-g(Z,W)\eta(B(Z,V)\xi)W)+\eta(W)\eta(B(Z,V)Z\right]=0$$

From (3.14), by contracting we get

$$\left[\frac{-2(n-3)(\rho-\alpha^2)^2-2(\alpha^2-\rho)(k-1)}{(n-3)}\right]\{g(V,W)+\eta(V)\eta(W)\}=0$$

This implies that $g(V,W)=-\eta(V)\eta(W)$. Then from (2.3) we get $g(\phi V,\phi W)=0$, however, as this is not possible. This proves the theorem3.3.

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Theorem3.4. A $(LCS)_n$ -manifold is projectively Ricci symmetric if and only if the manifold in an Einstein manifold.

Proof. Assume that in $(LCS)_n$ -manifold the condition $P(X,Y)\cdot S(Z,W)=0$ are satisfies, and then it can be expressed as

(3.15) $$S(P(X,Y)Z,W)+S(Z,P(X,Y)W=0$$

From (1.8) and (2.11) we get

(3.16) $$P(\xi,Y)Z=(\alpha^2-\rho)\left[g(Y,Z)\xi-\eta(Z)Y\right]-\frac{1}{(n-1)}\left[S(Y.Z)\xi-(n-1)(\alpha^2-\rho)\eta(Z)Y\right]$$

Taking $X=\xi$ in (3.15) by virtue of (2.11) and (3.16) we obtain

(3.17) $$S(Y,Z)=(n-1)(\alpha^2-\rho)\,g(Y,Z).$$

This proves the theorem3.4.

Theorem3.5. A $(LCS)_n$ -manifold is concircurly Ricci symmetric if and only if either scalar curvature $r=n(n-1)(\alpha^2-\rho)$ or the manifold in an Einstein manifold.

Proof. Assume that in $(LCS)_n$ -manifold satisfies the condition $C(X,Y)\cdot S(Z,W)=0$, and then it can be expressed as

(3.18) $$S(C(X,Y)Z,W)+S(Z,C(X,Y)W=0$$

From (1.9) and (2.11), we have

(3.19) $$C(\xi,Y)Z=\left[(\alpha^2-\rho)-\frac{r}{n(n-1)}\right]\{g(Y,Z)\xi-\eta(Z)Y\}$$

Taking $X=\xi$ in (3.18) by virtue of (3.19) and (2.11), we get

(3.20) $$\left[(\alpha^2-\rho)-\frac{r}{n(n-1)}\right]\{S(Y,Z)-2n(\alpha^2-\rho)g(Y,Z)\}=0$$

This implies that either $r=n(n-1)(\alpha^2-\rho)$ or $S(Y,Z)=2n(\alpha^2-\rho)g(Y,Z)$

This proves the theorem 3.5

Theorem3.6.A $(LCS)_n$ -manifold satisfies the condition $P(\xi,X)\cdot S=0$ if and only if the M^n is an Einstein manifold with scalar curvature $r=2n^2(\alpha^2-\rho)$.

Notes

Proof. The condition $P(\xi,X)\cdot S=0$ implies

(3.21) $$S(P(\xi,X)Y,\xi)+S(Y,P(\xi,X)\xi=0$$

By virtue of (2.8) and (2.11) ,equation (1.8) reduces that

(3.22) $$S(P(\xi,X)Y,\xi)=-2n(\alpha^2-\rho)^2\{g(X,Y)+\eta(X)\eta(Y)\} + \frac{1}{(n-1)}2n(\alpha^2-\rho)\left\{S(X,Y)+2n(\alpha^2-\rho)\eta(X)\eta(Y)\right\}$$

and

(3.23) $$S(P(\xi,X)\xi,\xi)=(\alpha^2-\rho)^2\left\{S(X,Y)+2n(\alpha^2-\rho)\eta(X)\eta(Y)\right\} - \frac{1}{(n-1)}2n(\alpha^2-\rho)\left\{S(X,Y)+2n(\alpha^2-\rho)\eta(X)\eta(Y)\right\}$$

Using (3.22)(3.23) in (3.21) , we get

$$S(X,Y)=2n(\alpha^2-\rho)g(X,Y)$$

This proves the theorem3.6

Corollary1. In $(LCS)_n$ -manifold the D-conformal curvature tensor B satisfies

(3.24) $$B(X,Y)\xi=\lambda\{\eta(Y)X-\eta(X)Y\}$$

where $$\lambda=\frac{(n+1)(\rho-\alpha^2)+(k-1)}{(n-3)}$$

Proof. Using (2.7) and (2.11) in (1.7) we get (3.24).

Definition3.2. The rotational motion (curl) of D-conformal curvature tensor B on a Riemannian manifold is given by

(3.25) $$Rot\,B=(\nabla_U B)(X,Y,Z)+(\nabla_X B)(U,Y,Z)+(\nabla_Y B)(U,X,Z)-(\nabla_Z B)(X,Y)U=0$$

By virtue of second Bianchi identity

(3.26) $$(\nabla_U B)(X,Y,Z)+(\nabla_X B)(Y,U,Z)+(\nabla_Y B)(U,X,Z)=0$$

Equation (3.25) reduces to

$$Rot\,B=-(\nabla_Z B)(X,Y)U$$

If the D-conformal curvature tensor is irrotational then curl B =0 and by (3.26),we have

$$(\nabla_Z B)(X,Y)U=0$$

This implies that

(3.27) $$\nabla_Z\{B(X,Y)U\} = B(\nabla_Z X,Y)U + B(X,\nabla_Z Y)U + B(X,Y)\nabla_Z U$$

In view of (3.27) with $U=\xi$ it is seen that

(3.28) $$\nabla_Z\{B(X,Y)\xi\} = B(\nabla_Z X,Y)\xi + B(X,\nabla_Z Y)\xi + B(X,Y)\nabla_Z \xi$$

Theorem .3.7. If the *D*- conformal curvature tensor in *(LCS)*$_n$ -manifold is irrotational then the *D* - conformal curvature tensor *B* is given by (3.30)

Proof. Using (3.24) and (1.5) in (3.28), we get

(3.29) $$B(X,Y)\phi Z = \lambda\left[(\nabla_Z\eta)(Y)X - (\nabla_Z\eta)(X)Y\right]$$

Replacing Z by ϕZ in (3.29) by using (1.3) and (1.6) it is seen that

(3.30) $$B(X,Y)Z = \lambda\left\{g(\phi Z,Y)X - g(\phi Z,X)Y - \eta(Y)\eta(Z)X + \eta(X)\eta(Z)Y\right\}$$

This proves the theorem3.7.

Theorem3.8. If the D -conformal curvature tensor in $(LCS)_n$ -manifold is irrotational then the manifold is an η–Einstein manifold with scalar curvature

$$\tau = \left[\frac{n(n-3)+2n\{(n-1)(\alpha^2-\rho)-(k-2)\}-(n-1)(\alpha^2-\rho)}{(n-1)}\right]$$

Proof. Using (3.21) in (1.7) the curvature tensor of B in $(LCS)_n$ -manifold is given by

(3.31) $$R(X,Y)Z = \lambda\begin{bmatrix} g(Z,Y)X - g(Z,X)Y \\ -\eta(Y)\eta(Z)X + \eta(X)\eta(Z)Y \end{bmatrix} - \frac{1}{(n-3)}\begin{bmatrix} S(X,Z)Y - S(Y,Z)X + g(X,Z)QY \\ -g(Y,Z)QX - S(X,Z)\eta(Y)\xi \\ +S(Y,Z)\eta(X)\xi - \eta(X)\eta(Z)QY \\ +\eta(Y)\eta(Z)QX \end{bmatrix}$$
$$+\frac{(k-2)}{(n-3)}\{g(X,Z)Y - g(Y,Z)X\} - \frac{k}{(n-3)}\begin{Bmatrix} g(X,Z)\eta(Y)\xi - g(Y,Z)\eta(X)\xi \\ +\eta(X)\eta(Z)Y - \eta(Y)\eta(Z)X \end{Bmatrix}$$

Let $X_i,\ i=1,2,3,\ldots,n$ be an orthonornal basis of the tangent space at any point .Then the sum for $1\le i\le n$ of the relation (3.31) with $Y=D=X_i$, yields

(3.32) $$\sum R(X,X_i)X_i = \lambda\left[g(X_i,X_i)X - g(X,X_i)X_i\right] - \frac{1}{(n-3)}\begin{bmatrix} S(X,X_i)X_i - S(X_i,X_i)X + g(X,X_i)QX_i \\ -g(X_i,X_i)QX + S(X_i,X_i)\eta(X)\xi \end{bmatrix}$$
$$+\frac{(k-2)}{(n-3)}\{g(X,X_i)X_i - g(X_i,X_i)X\} + \frac{k}{(n-3)}\{g(X_i,X_i)(X)\xi\}$$

Notes

The Ricci tensor S is given by

(3.33) $$SX,Y) = \sum g(R(X,X_i)X_i,Y) + g(X,Y)$$

Taking inner product of (3.32) with Y and by virtue of (3.31) and (3.33), we get

(3.34) $$S(X,Y) = a\ g(X,Y) + b\eta(X)\eta(Y)$$

where $$a = \left[\frac{(n-3)+2(n-1)(\alpha^2-\rho)-2(k-2)}{(n-1)}\right], \quad \text{and} \quad b = (\alpha^2 - \rho)$$

This implies that the manifold is an η–Einstein manifold.

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References Références Referencias

1. A. A. Shaikh; On Lorentzian almost paracontact manifolds with a structure of the concircular type, Kyungpook Math.J.43 (2003), 305-314.
2. B. O' Neill; Semi-Riemannian geometry with Applications to Relativity. Academic Press, Inc., New York, 1983.
3. K. Matsumoto; On Lorentzian almost paracontact manifolds, Bull. Yamagata Univ.Natur.Soci.12(1989), 151-156.
4. G. Chuman; On D-conformal curvature tensor, Tensor N.S.46 (1983), 125-129.
5. H. Singh, Q. Khan; on generalized recurrent Riemannian manifolds. Publ.Math. Debreceen, Hungary 56/1-2(2000) 87-95.
6. S. Yadav and D. L. Suthar, Ceratain Derivations Conditions on Lorentzian α -Sasakian manifolds Global Journal of Science Frontier Research (F).Volume.XII Issue II Version.I.105-106. (2012), Open Association of Research Socirty, United States
7. Sunil Kumar Yadav, Praduman .K.Dwivedi and Dayalal.Suthar: On $(LCS)_{2n+1}$ – Manifolds Satisfying Certain Conditions on the Concircular Curvature Tensor, ThiJournal of Mathematics, Vol. (9) (2011), 597-603, Thailand.
8. S. Yadav and D. L. Suthar; On Three-Dimensional Generalized Sasakian space-forms. African Journal of Mathematics & Compute sciences Research.Vol.5 ,1,(2012), 17-22..
9. S. Yadav D. L. Suthar and A.K Srivastava: Some Results on $M(f_1, f_2, f_3)_{2n+1}$ Manifolds. International Journal of Pure & Applied Mathematics, Vol.70. 3, (2011), 415-423., Sofia, Bulgaria.Ruse.
10. C. S. Bagewadi, E. Girish Kumar and Venkatesha: On irrotational D-conformal curvature tensor.NOVI.SAD J.MATH.Vol.35, 2, (2005) 85-92.