ON *GF*-STRUCTURE

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In this paper we have considered generalized holomorphic sectional curvature of V_n equipped with *H*-structure and *KH*-structure. Some of its properties have been discussed.

1. INTRODUCTION

We consider a C^∞ manifold V_n. Let there exist on V_n a vector valued bilinear function F of class C^∞ such that

$$\bar{\bar{X}} = a^2 X \qquad \ldots(1.1)$$

for any arbitrary vector field X, where $F(X) = \bar{X}$ and a is a complex constant. Let us agree to say that F gives to V_n a differential structure briefly *GF*-structure defined by algebraic equation (1.1). If the given *GF*-structure is endowed with a Riemannian metric g such that

$$g(\bar{X}, \bar{Y}) = -\, a^2 g(X, Y) \qquad \ldots(1.2)$$

then we say that (F, g) gives to V_n a *H*-structure.

In the sequel arbitrary vector fields are denoted by X, Y, Z, ... etc.

Let us consider on V_n equipped with *H*-structure a tensor $'F$ of the type (0, 2) such that

$$'F(X, Y) \overset{def}{=} g(\bar{X}, Y) = -\, g(X, \bar{Y}). \qquad \ldots(1.3)$$

Then it is easy to verify

$$'F(\bar{X}, Y) = -\, 'F(X, \bar{Y}) \qquad \ldots(1.4a)$$

$$'F(\bar{X}, \bar{Y}) = -\, a^2\, 'F(X, Y) \qquad \ldots(1.4b)$$

and

$$'F(X, Y) = -\, 'F(Y, X). \qquad \ldots(1.4c)$$

We further identify connexion D to a suitable symmetric connexion with respect to g. If for *H*-structure

$$(D_X F)(Y) = 0 \qquad \ldots(1.5)$$

is satisfied, we say that H-structure is KH-structure. Let K be the curvature tensor of V_n. Weyl curvature tensor W, conformal curvature tensor V, conharmonic curvature tensor L and concircular curvature tensor C are respectively given by

$$W(X, Y, Z) = K(X, Y, Z) - \frac{1}{2m-1}\{X \operatorname{Ric}(Y, Z) - Y \operatorname{Ric}(X, Z)\} \qquad \ldots(1.6a)$$

$$V(X, Y, Z) = K(X, Y, Z) - \frac{1}{2(m-1)}\{X \operatorname{Ric}(Y, Z) - Y \operatorname{Ric}(X, Z) - g(X, Z)\, R(Y) + g(Y, Z)\, R(X)\} + \frac{r}{2(m-1)(2m-1)}\{X g(Y, Z) - Y g(X, Z)\} \qquad \ldots(1.6b)$$

$$L(X, Y, Z) = K(X, Y, Z) - \frac{1}{2(m-1)}\{g(Y, Z)\, R(X) - g(X, Z)\, R(Y) + X \operatorname{Ric}(Y, Z) - Y \operatorname{Ric}(X, Z)\} \qquad \ldots(1.6c)$$

$$C(X, Y, Z) = K(X, Y, Z) - \frac{r}{2m(2m-1)}\{Xg(Y, Z) - Yg(X, Z)\}. \qquad \ldots(1.6d)$$

For V_n equipped with KH-structure we have,

$$K(X, Y, \bar{Z}) = \overline{K(X, Y, Z)} \qquad \ldots(1.7a)$$

$$\overline{K(X, Y, \bar{Z})} = a^2 K(X, Y, Z) \qquad \ldots(1.7b)$$

$$'K(X, Y, \bar{Z}, U) = -\,'K(X, Y, Z, \bar{U}) \qquad \ldots(1.7c)$$

$$'K(X, Y, \bar{Z}, \bar{U}) = -\,a^2\,'K(X, Y, Z, U) \qquad \ldots(1.7d)$$

where

$$'K(X, Y, Z, U) \overset{def}{=} g(K(X, Y, Z), U) \qquad \ldots(1.7e)$$

$$R(\bar{X}, \bar{Y}) = -\,a^2 R(X, Y). \qquad \ldots(1.7f)$$

2. Generalized Holomorphic Sectional Curvature of V_n Equipped with H-Structure

Definition 2.1 — Let V_n $(n = 2m)$ be equipped with H-structure. The plane element determined by X, $\bar{X}$ is called a holomorphic section of V_n. The sectional curvature of V_n at a point with regard to a holomorphic section determined by X is called holomorphic sectional curvature with regard to X.

For V_n equipped with H-structure, the generalized holomorphic sectional curvature k with regard to X is given by

$$k = \frac{'K(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(\bar{X}, \bar{X})}. \quad \ldots(2.1)$$

Theorem 2.1 — The generalized sectional curvature k of V_n equipped with H-structure is given by

$$k = \frac{'W(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} + \frac{1}{(2m-1)} \frac{\text{Ric}\,(X, X)}{g(X, X)} \quad \ldots(2.2a)$$

$$k = \frac{'V(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} + \frac{1}{2(m-1)} \left[\frac{a^2 \text{Ric}\,(X, X) - \text{Ric}\,(\bar{X}, \bar{X})}{a^2 g(X, X)}\right] - \frac{r}{2(m-1)(2m-1)} \quad \ldots(2.2b)$$

$$k = \frac{'L(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} - \frac{1}{2(m-1)} \left[\frac{\text{Ric}\,(\bar{X}, \bar{X}) - a^2\, \text{Ric}\,(X, X)}{a^2 g(X, X)}\right] \quad \ldots(2.2c)$$

$$k = \frac{'C(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} + \frac{r}{2m(2m-1)}. \quad \ldots(2.2d)$$

PROOF : We define

$$'W(X, Y, Z, U) \overset{def}{=} g(W(X, Y, Z), U) \quad \ldots(2.3a)$$

$$'V(X, Y, Z, U) \overset{def}{=} g(V(X, Y, Z), U) \quad \ldots(2.3b)$$

$$'L(X, Y, Z, U) \overset{def}{=} g(L(X, Y, Z), U) \quad \ldots(2.3c)$$

$$'C(X, Y, Z, U) \overset{def}{=} g(C(X, Y, Z), U). \quad \ldots(2.3d)$$

From (1.6*a*), (1.2), (1.3), (1.4*c*) and (2.3*a*) we get

$$'W(X, \bar{X}, X, \bar{X}) = {'K}(X, \bar{X}, X, \bar{X}) - \frac{1}{2m-1}\, a^2 g(X, X)\, \text{Ric}\,(X, X).$$

Substituting in above from (2.1) we get (2.2*a*). From (1.6*b*), (1.2), (1.3), (1.4*c*) and (2.3*d*) we get

$$'V(X, \bar{X}, X, \bar{X}) = {'K}(X, \bar{X}, X, \bar{X}) - \frac{1}{2(m-1)} [a^2 g(X, X)\, \text{Ric}\,(X, X) - g(X, X)\, \text{Ric}\,(\bar{X}, \bar{X})] + \frac{ra^2}{2(m-1)(2m-1)}\, g(X, X)\, g(X, X).$$

Substituting from (2.1) in above we get (2.2*b*). From (1.6*c*), (1.2), (1.3), (1.4*c*) and (2.3*c*) we get

$$'L(X, \bar{X}, X, \bar{X}) = 'K(X, \bar{X}, X, \bar{X}) + \frac{1}{2(m-1)} [g(X, X) \operatorname{Ric}(\bar{X}, \bar{X}) - a^2 g(X, X) \operatorname{Ric}(X, X)].$$

Substituting from (2.1) in above we get (2.2*c*). From (1.6*d*), (1.2), (1.3), (1.4*c*) and (2.3*d*) we get

$$'C(X, \bar{X}, X, \bar{X}) = 'K(X, \bar{X}, X, \bar{X}) - \frac{ra^2}{2m(2m-1)} g(X, X)\, g(X, X).$$

Substituting from (2.1) in above we get (2.2*d*).

Corollary 2.1 — The generalized holomorphic sectional curvature k of V_n equipped with H-structure in the direction of a unit vector X is given by

$$a^2 k = 'K(X, \bar{X}, X, \bar{X}) \quad ...(2.4a)$$

$$k = \frac{'W(X, \bar{X}, X, \bar{X})}{a^2} + \frac{1}{2m-1} \operatorname{Ric}(X, X) \quad ...(2.4b)$$

$$k = \frac{'V(X, \bar{X}, X, \bar{X})}{a^2} + \frac{1}{2(m-1)} \left[\frac{a^2 \operatorname{Ric}(X, X) - \operatorname{Ric}(\bar{X}, \bar{X})}{a^2} \right] - \frac{r}{2(m-1)(2m-1)} \quad ...(2.4c)$$

$$k = \frac{'L(X, \bar{X}, X, \bar{X})}{a^2} + \frac{1}{2(m-1)} \left[\frac{a^2 \operatorname{Ric}(X, X) - \operatorname{Ric}(\bar{X}, \bar{X})}{a^2} \right] \quad ...(2.4d)$$

$$k = \frac{'C(X, \bar{X}, X, \bar{X})}{a^2} + \frac{r}{2m(2m-1)}. \quad ...(2.4e)$$

PROOF: Putting for $g(X, X)$ unity in eqns. (2.1), (2.2*a*), (2.2*b*), (2.2*c*) and (2.2*d*), we get (2.4*a*), (2.4*b*), (2.4*c*), (2.4*d*) and (2.4*e*).

Theorem 2.2 — The condition that the V_n equipped with H-structure be of constant generalized holomorphic sectional curvature is

$$\begin{aligned} &3a^4\, 'K(X, Y, Z, U) - 3a^2\, 'K(\bar{X}, \bar{Y}, Z, U) - 3a^2\, 'K(X, Y, \bar{Z}, \bar{U}) \\ &+ 3\, 'K(\bar{X}, \bar{Y}, \bar{Z}, \bar{U}) + a^2\, 'K(\bar{Y}, \bar{Z}, X, U) - a^2\, 'K(\bar{X}, \bar{Z}, Y, U) \\ &+ a^2\, 'K(Z, Y, \bar{U}, \bar{X}) - a^2\, 'K(Z, X, \bar{U}, \bar{Y}) \\ &+ a^2\, 'K(\bar{U}, Y, Z, \bar{X}) - a^2\, 'K(\bar{U}, X, Z, \bar{Y}) \\ &+ a^2\, 'K(\bar{Y}, U, X, \bar{Z}) - a^2\, 'K(\bar{X}, U, Y, \bar{Z}) \\ &= -4a^4 k [2\, 'F(X, Y)\, 'F(Z, U) \\ &\quad - a^2 g(X, Z)\, g(Y, U) + a^2 g(Y, Z)\, g(X, U) \\ &\quad + 'F(Y, Z)\, 'F(U, X) - 'F(X, Z)\, 'F(U, Y)]. \end{aligned} \quad ...(2.5)$$

PROOF : We know that the necessary and sufficient condition that the V_n equipped with H-structure be of constant generalized holomorphic sectional curvature with respect to any vector field X is that eqn. (2.1) is satisfied for an arbitrary vector field X. This statement is equivalent to

$$\begin{aligned}&'K(X, \bar{Y}, Z, \bar{U}) + 'K(Y, \bar{X}, Z, \bar{U}) + 'K(X, \bar{Y}, U, \bar{Z})\\ &\quad + 'K(Y, \bar{X}, U, \bar{Z}) + 'K(Z, \bar{Y}, X, \bar{U}) + 'K(Y, \bar{Z}, X, \bar{U})\\ &\quad + 'K(Z, \bar{Y}, U, \bar{X}) + 'K(Y, \bar{Z}, U, \bar{X}) + 'K(U, \bar{Y}, Z, \bar{X})\\ &\quad + 'K(Y, \bar{U}, Z, \bar{X}) + 'K(U, \bar{Y}, X, \bar{Z}) + 'K(Y, \bar{U}, X, \bar{Z})\\ &\qquad = -4a^4k[g(X, Y)\, g(Z, U) + g(X, Z)\, g(Y, U)\\ &\qquad\qquad + g(Y, Z)\, g(X, U)]. \qquad \ldots(2.6)\end{aligned}$$

Barring Y, U in above and using (1.1), (1.3) we get

$$\begin{aligned}&a^4\, 'K(X, Y, Z, U) + a^2\, 'K(\bar{Y}, \bar{X}, Z, U) + a^2\, 'K(X, Y, \bar{U}, \bar{Z})\\ &\quad + 'K(\bar{Y}, \bar{X}, \bar{U}, \bar{Z}) + a^4\, 'K(Z, Y, X, U) + a^2\, 'K(\bar{Y}, \bar{Z}, X, U)\\ &\quad + a^2\, 'K(Z, Y, \bar{U}, \bar{X}) + 'K(\bar{Y}, \bar{Z}, \bar{U}, \bar{X}) + a^2\, 'K(\bar{U}, Y, Z, \bar{X})\\ &\quad + a^2\, 'K(\bar{Y}, U, Z, \bar{X}) + a^2\, 'K(\bar{U}, Y, X, \bar{Z}) + a^2\, 'K(\bar{Y}, U, X, \bar{Z})\\ &\qquad = -4a^4k['F(Y, X)\, 'F(U, Z) - a^2 g(X, Z)\, g(Y, U)\\ &\qquad\qquad + 'F(Y, Z)\, 'F(U, X)]. \qquad \ldots(2.7)\end{aligned}$$

Taking skew-symmetric part of eqn. (2.7) in X, Y we get

$$\begin{aligned}&2a^4\, 'K(X, Y, Z, U) + 2a^2\, 'K(\bar{Y}, \bar{X}, Z, U) + 2a^2\, 'K(X, Y, \bar{U}, \bar{Z})\\ &\quad + 2'K(\bar{Y}, \bar{X}, \bar{U}, \bar{Z}) + a^4\, 'K(Z, Y, X, U) - a^4\, 'K(Z, X, Y, U)\\ &\quad + a^2\, 'K(\bar{Y}, \bar{Z}, X, U) - a^2\, 'K(\bar{X}, \bar{Z}, Y, U) + a^2\, 'K(Z, Y, \bar{U}, \bar{X})\\ &\quad - a^2\, 'K(Z, X, \bar{U}, \bar{Y}) + 'K(\bar{Y}, \bar{Z}, \bar{U}, \bar{X}) - 'K(\bar{X}, \bar{Z}, \bar{U}, \bar{Y})\\ &\quad + a^2\, 'K(\bar{U}, Y, Z, \bar{X}) - a^2\, 'K(\bar{U}, X, Z, \bar{Y}) + a^2\, 'K(\bar{Y}, U, Z, \bar{X})\\ &\quad - a^2\, 'K(\bar{X}, U, Z, \bar{Y}) + a^2\, 'K(\bar{U}, Y, X, \bar{Z}) - a^2\, 'K(\bar{U}, X, Y, \bar{Z})\\ &\quad + a^2\, 'K(\bar{Y}, U, X, \bar{Z}) - a^2\, 'K(\bar{X}, U, Y, \bar{Z})\\ &\qquad = -4a^4k\,[2\, 'F(X, Y)\, 'F(Z, U) - a^2 g(X, Z)\, g(Y, U)\\ &\qquad\qquad + a^2 g(Y, Z)\, g(X, U) + 'F(Y, Z)\, 'F(U, X)\\ &\qquad\qquad - 'F(X, Z)\, 'F(U, Y)].\end{aligned}$$

Using Bianchi's first identity in above we get (2.5).

Note 2.1 : For $a = \pm i$ expressions (2.1), (2.2*a*), (2.2*b*), (2.2*d*) and (2.5) hold for almost Hermite manifold.

3. Generalized Holomorphic Sectional Curvature of V_n Equipped with *KH*-Structure

Theorem 3.1 — For V_n equipped with *KH*-structure the generalized holomorphic sectional curvature is given by

$$k = \frac{'K(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} \qquad \text{...(3.1}a\text{)}$$

$$k = \frac{'W(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} + \frac{1}{2m-1} \frac{\text{Ric}\,(X, X)}{g(X, X)} \qquad \text{...(3.1}b\text{)}$$

$$k = \frac{'V(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} + \frac{1}{m-1} \frac{\text{Ric}\,(X, X)}{g(X, X)} - \frac{r}{2(m-1)(2m-1)} \qquad \text{...(3.1}c\text{)}$$

$$k = \frac{'L(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} + \frac{1}{m-1} \frac{\text{Ric}\,(X, X)}{g(X, X)} \qquad \text{...(3.1}d\text{)}$$

$$k = \frac{'C(X, \bar{X}, X, \bar{X})}{a^2 g(X, X)\, g(X, X)} + \frac{r}{2m(2m-1)} \qquad \text{...(3.1}e\text{)}$$

Proof : By putting the value of $R(\bar{X}, \bar{X})$ from (1.7*f*) in (2.1), (2.2*a*), (2.2*b*), (2.2*c*) and (2.2*d*) where required we obtain (3.1*a*), (3.1*b*), (3.1*c*), (3.1*d*) and (3.1*e*).

Corollary 3.1 — The generalized holomorphic sectional curvature k of V_n equipped with *KH*-structure in the direction of a unit vector X is given by

$$a^2 k = {}'K(X, \bar{X}, X, \bar{X}) \qquad \text{...(3.2}a\text{)}$$

$$k = \frac{'W(X, \bar{X}, X, \bar{X})}{a^2} + \frac{1}{2m-1} \text{Ric}\,(X, X) \qquad \text{...(3.2}b\text{)}$$

$$k = \frac{'V(X, \bar{X}, X, \bar{X})}{a^2} + \frac{1}{m-1} \text{Ric}\,(X, X) - \frac{r}{2(m-1)(2m-1)} \qquad \text{...(3.2}c\text{)}$$

$$k = \frac{'L(X, \bar{X}, X, \bar{X})}{a^2} + \frac{1}{m-1} \text{Ric}\,(X, X) \qquad \text{...(3.2}d\text{)}$$

$$k = \frac{'C(X, \bar{X}, X, \bar{X})}{a^2} + \frac{r}{2m(2m-1)}. \qquad \text{...(3.2}e\text{)}$$

Proof : By putting $g(X, X)$ unity in (3.1*a*), (3.1*b*), (3.1*c*), (3.1*d*) and (3.1*e*) we get (3.2*a*), (3.2*b*), (3.2*c*), (3.2*d*) and (3.2*e*) respectively.

Theorem 3.2 — The condition that V_n equipped with *KH*-structure be of constant generalized holomorphic sectional curvature with respect to any vector X is

$$4\,'K(X, Y, Z, U) = -k\,[2\,'F(X, Y)\,'F(Z, U) - a^2 g(X, Z)\,g(Y, U) + a^2 g(Y, Z)\,g(X, U) + 'F(Y, Z)\,'F(U, X) - 'F(X, Z)\,'F(U, Y)]. \quad ...(3.3)$$

PROOF : Substituting from (1.7*d*) and (1.7*e*) in (2.5) and using algebraic identities satisfied by $'K(X, Y, Z, U)$ we obtain (3.3).

Theorem 3.3 — If V_n equipped with *KH*-structure be of constant generalized holomorphic sectional curvature. Then

$$\text{Ric}\,(Y, Z) = -k^2\left(\frac{m+1}{2}\right) a^2 g(Y, Z).$$

PROOF : From (3.3), (1.3) and (1.4*c*) we have

$$4\,'K(X, Y, Z, U) = -k\,[2\,'F(X, Y)\,g(\bar{Z}, U) - a^2 g(X, Z)\,g(Y, U) + a^2 g(Y, Z)\,g(X, U) - 'F(Y, Z)\,g(\bar{X}, U) + 'F(X, Z)\,g(\bar{Y}, U)]. \quad ...(3.4)$$

Contracting U we get

$$4K(X, Y, Z) = -k\,[2\,'F(X, Y)\,\bar{Z} - a^2 g(X, Z)\,Y + a^2 g(Y, Z)\,X - 'F(Y, Z)\,\bar{X} + 'F(X, Z)\,\bar{Y}].$$

Contracting X and using (1.1) we get (3.4).

Note 3.1 : For $a = \pm i$, Theorem (3.1), Theorem (3.2), hold for Kähler manifold. Also for $a = \pm i$ equation (3.4) represents Einstein manifold.

Theorem 3.4 — If $'k$ is the generalized section curvature of V_n equipped with *KH*-structure of constant generalized holomorphic sectional curvature k with respect to two unit orthogonal vector fields P, Q, then

$$'k = -\frac{1}{4a^2}\,k\,[3\cos^2\theta - a^2] \quad ...(3.5)$$

where θ is the angle between $\bar{P}$ and Q.

PROOF : We define the generalized section curvature $'k$

$$'k \overset{def}{=} \frac{'K(P, Q, P, Q)}{a^2}. \quad ...(3.6)$$

From (3.6) and (3.3) we get

$$4a^2\,'k = -k\,[3\{'F(P, Q)\}^2 - a^2]$$

i.e. $$4a^2\,'k = -\,k\,[3\{g(\overline{P}, Q)\}^2 - a^2]$$

i.e. $$'k = -\,\frac{k}{4a^2}\,[3\cos^2\theta - a^2].$$

Note 3.2 : For $a = \pm\, i$ (3.6) becomes

$$\left.\begin{array}{ll} k \leqslant 4\,'k \leqslant 4k, & k > 0 \\ k \geqslant 4\,'k \geqslant 4k, & k < 0. \end{array}\right\} \qquad \text{(Yano 1965)}$$

Corollary 3.2 — If

$$'l(Y, Z) \overset{def}{=} (C_1^1\, L)\,(Y, Z) \qquad \text{...(3.7)}$$

$$\alpha \overset{def}{=} C_1^1\, l \qquad \text{...(3.8)}$$

$$'l(Y, Z) \overset{def}{=} g(l(X), Y). \qquad \text{...(3.9)}$$

Then

$$'l(Y, Z) = \frac{ka^2m(m+1)}{2(m-1)}\, g(Y, Z) \qquad \text{...(3.10a)}$$

$$\alpha = \frac{ka^2m^2(m+1)}{m-1}. \qquad \text{...(3.10b)}$$

PROOF : From (1.6c) and (3.7) we obtain

$$'l(Y, Z) = -\,\frac{r}{2(m-1)}\, g(Y, Z). \qquad \text{...(3.11)}$$

From (3.4) on contraction generalized scalar curvature r is given by

$$r = -\,ka^2m(m+1). \qquad \text{...(3.12)}$$

From (3.11) and (3.8) we have

$$\alpha = -\,\frac{r}{2(m-1)}\, 2m. \qquad \text{...(3.13)}$$

From (3.11), (3.12) and (3.13) we obtain (3.10*a*) and (3.10*b*).

Theorem 3.5 — If V_n equipped with *KH*-structure be of constant generalized holomorphic sectional curvature k we have

$$'W(X, Y, Z, U) = -\,\tfrac{1}{4}k\,[2\,'F(X, Y)\,'F(Z, U) - 'F(Y, Z)\,'F(X, U) + 'F(X, Z)\,'F(Y, U)] + \frac{3ka^2}{4(2m-1)}\,[g(Y, Z)\, g(X, U) - g(X, Z)\, g(Y, U)] \qquad \text{...(3.14a)}$$

$$'V(X, Y, Z, U) = -\tfrac{1}{4}k\,[2\,'F(X, Y)\,'F(Z, U) - 'F(Y, Z)\,'F(X, U) + 'F(X, Z)\,'F(Y, U)] + \frac{3ka^2}{4(2m-1)}\,[g(Y, Z) - g(X, U) - g(X, Z)\,g(Y, U)] \quad ...(3.14b)$$

$$'L(X, Y, Z, U) = -\tfrac{1}{4}k\,[2\,'F(X, Y)\,'F(Z, U) - 'F(Y, Z)\,'F(X, U) + 'F(X, Z)\,'F(Y, U)] + \frac{ka^2(m+3)}{4(m-1)}\,[g(Y, Z)\,g(X, U) - g(X, Z)\,g(Y, U)] \quad ...(3.14c)$$

$$'C(X, Y, Z, U) = -\tfrac{1}{4}k\,[2\,'F(X, Y)\,'F(Z, U) - 'F(Y, Z)\,'F(X, U) + 'F(X, Z)\,'F(Y, U)] + \frac{3ka^2}{4(2m-1)}\,[g(Y, Z)\,g(X, U) - g(X, Z)\,g(Y, U)]. \quad ...(3.14d)$$

Consequently for V_n equipped with *KH*-structure of constant generalized holomorphic sectional curvature $'W(X, Y, Z, U)$, $'V(X, Y, Z, U)$, $'L(X, Y, Z, U)$ and $'C(X, Y, Z, U)$ are all skew symmetric in Z and U. Also they are all symmetric in two pair of slots (X, Y), (Z, U).

PROOF: Substituting the values from (3.3), (3.4), (3.12) in (1.6*a*), (1.6*b*), (1.6*c*) and (1.6*d*) we obtain (3.14*a*), (3.14*b*), (3.14*c*) and (3.14*d*).

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