Transactions of A. Razmadze
Mathematical Institute
Vol. **175** (2021), issue 1, 143–147

ON THE F STRUCTURES OF THE SPACE $T(Lm(Vn))$

GOCHA TODUA

Abstract. There are constructed lifts of tensor fields a^i_j, a^i_α, $a^i_{\overline{j}}$, $a^i_{\overline{\alpha}}$, $a^{\overline{i}}_j$, $a^{\overline{i}}_\alpha$, $a^{\overline{i}}_{\overline{j}}$, $a^{\overline{i}}_{\overline{\alpha}}$, a^β_j, a^β_α, $a^\beta_{\overline{j}}$, $a^\beta_{\overline{\alpha}}$, $a^{\overline{\beta}}_j$, $a^{\overline{\beta}}_\alpha$, $a^{\overline{\beta}}_{\overline{j}}$, $a^{\overline{\beta}}_{\overline{\alpha}}$. There are defined F structures on the space $a^{\overline{\beta}}_j$ and there is proved, that real-valued F structures exist only for $\lambda = -1$.

Consider a tangent bundle $T(Lm(Vn))$ with the local coordinates x^i, y^α, y^i, z^α where are the coordinates of the basis $T(Lm(Vn))$, and y^i, z^α are those of the layer T_z, $z \in Lm(Vn)$, in other words, the vector fields X,

$$X = y^i \frac{\partial}{\partial x^i} + z^\alpha \frac{\partial}{\partial y^\alpha},$$

generate the bundle $T(Lm(Vn))$. It is now evident that the local coordinates $(x^i, y^\alpha, y^i, z^\alpha)$ of the point of the space $T(Lm(Vn))$ are transformed as follows:

$$\overline{x}^i = \overline{x}^i(x^k), \quad \overline{y}^\alpha = A^\alpha_\beta(x) y^\beta, \quad \overline{y}^i = x^i_k(y^k), \quad \overline{z}^\alpha = A^\alpha_\beta z^\beta + A^\alpha_{\beta k} y^\beta y^k.$$

A complete equipment of the space $T(Lm(Vn))$ can be defined by means of the vectors D_i, D_α, D_k [1–4]:

$$D_i = \frac{\partial}{\partial y^i} - Q^\alpha_i \frac{\partial}{\partial z^\alpha}, \quad D_\alpha = \frac{\partial}{\partial y^\alpha} - E^\beta_\alpha \frac{\partial}{\partial z^\beta}, \quad D_k = \frac{\partial}{\partial x^k} - C^\alpha_k \frac{\partial}{\partial z^\alpha} - Q^\alpha_k \frac{\partial}{\partial y^\alpha} - E^i_k \frac{\partial}{\partial y^i}.$$

Note that the tensor field T can be represented as

$$\begin{aligned} T &= T^i_j dx^j \otimes \frac{\partial}{\partial x^i} + T^i_\alpha dx^\alpha \otimes \frac{\partial}{\partial x^i} + T^i_{\overline{j}} dy^j \otimes \frac{\partial}{\partial x^i} + T^i_{\overline{\alpha}} dz^\alpha \otimes \frac{\partial}{\partial x^i} \\ &+ T^\alpha_i dx^i \otimes \frac{\partial}{\partial y^\alpha} + T^\alpha_\beta dy^\beta \otimes \frac{\partial}{\partial y^\alpha} + T^\alpha_{\overline{i}} dy^i \otimes \frac{\partial}{\partial y^\alpha} + T^\alpha_{\overline{\beta}} dz^\beta \otimes \frac{\partial}{\partial y^\alpha} \\ &+ T^{\overline{i}}_j dx^j \otimes \frac{\partial}{\partial y^i} + T^{\overline{i}}_\alpha dy^\alpha \otimes \frac{\partial}{\partial y^i} + T^{\overline{i}}_{\overline{j}} dy^j \otimes \frac{\partial}{\partial y^i} + T^{\overline{i}}_{\overline{\alpha}} dz^\alpha \otimes \frac{\partial}{\partial y^i} \\ &+ T^{\overline{\alpha}}_i dx^i \otimes \frac{\partial}{\partial z^\alpha} + T^{\overline{\alpha}}_\beta dy^\beta \otimes \frac{\partial}{\partial z^\alpha} + T^{\overline{\alpha}}_{\overline{i}} dy^i \otimes \frac{\partial}{\partial z^\alpha} + T^{\overline{\alpha}}_{\overline{\beta}} dz^\beta \otimes \frac{\partial}{\partial z^\alpha}. \end{aligned}$$

The tensor T in the equipped basis can be decomposed as follows:

$$\begin{aligned} T &= a^i_j dx^j \otimes D_i + a^i_\alpha Dy^\alpha \otimes D_i + a^i_{\overline{j}} Dy^j \otimes D_i + a^i_{\overline{\alpha}} Dz^\alpha \otimes D_i \\ &+ a^\alpha_\beta Dy^\beta \otimes D_\alpha + a^\beta_j dx^j \otimes D_\beta + a^\beta_{\overline{j}} Dy^j \otimes D_\beta + a^\beta_{\overline{\alpha}} Dz^\alpha \otimes D_\beta \\ &+ a^{\overline{i}}_j dx^j \otimes D_i + a^{\overline{i}}_\beta Dy^\beta \otimes D_{\overline{i}} + a^{\overline{i}}_{\overline{j}} Dy^j \otimes D_{\overline{i}} + a^{\overline{i}}_{\overline{\alpha}} Dz^\alpha \otimes D_{\overline{i}} \\ &+ a^{\overline{\alpha}}_i dx^i \otimes D_{\overline{\alpha}} + a^{\overline{\alpha}}_\beta Dy^\beta \otimes D_{\overline{\alpha}} + a^{\overline{\alpha}}_{\overline{i}} Dy^i \otimes D_{\overline{\alpha}} + a^{\overline{\alpha}}_{\overline{\beta}} Dz^\beta \otimes D_{\overline{\alpha}}, \end{aligned}$$

where

$$\begin{aligned} Dy^\alpha &= dy^\alpha + C^\alpha_k dx^k, \\ Dy^i &= dy^i + \Gamma^i_j dx^j, \\ Dz^\alpha &= dz^\alpha + L^\alpha_k dx^k + C^\alpha_k dy^k + G^\alpha_\beta dy^\beta. \end{aligned}$$

2020 *Mathematics Subject Classification.* 53B05.
Key words and phrases. Tangent bundle; Vector fields; Lifts; Tensor filds; Structures.

From the above equalities, after removing the parentheses, we obtain

$$T=(a^i_j+a^i_{\overline{p}}\Gamma^p_j+a^i_\beta\Gamma^\beta_j+a^i_{\overline{\gamma}}L^\gamma_j)dx^j\otimes\frac{\partial}{\partial x^i}$$
$$+(a^\alpha_j-a^i_j\Gamma^\alpha_i-a^i_{\overline{p}}\Gamma^\alpha_i\Gamma^p_j-a^i_{\overline{\gamma}}\Gamma^\alpha_i\Gamma^\gamma_j+a^\alpha_\beta\Gamma^\beta_j+a^\alpha_{\overline{p}}\Gamma^p_j+a^\alpha_{\overline{\beta}}L^\beta_j)dx^j\otimes\frac{\partial}{\partial y^\alpha}$$
$$+(a^{\overline{k}}_j-a^i_j\Gamma^k_i-a^i_\beta\Gamma^k_i\Gamma^\beta_j-a^i_{\overline{p}}\Gamma^k_i\Gamma^p_j-a^i_{\overline{\gamma}}\Gamma^k_iL^\gamma_j+a^{\overline{k}}_\alpha\Gamma^\alpha_j+a^{\overline{k}}_{\overline{p}}\Gamma^p_j+a^{\overline{k}}_{\overline{\alpha}}L^\alpha_j)dx^j\otimes\frac{\partial}{\partial y^k}$$
$$+(a^{\overline{\beta}}_j-a^i_jC^\beta_i-a^i_\alpha C^\beta_i\Gamma^\alpha_j-a^i_{\overline{p}}C^\beta_i\Gamma^p_j-a^i_{\overline{\gamma}}C^\beta_iL^\gamma_j-a^\alpha_jG^\beta_\alpha-a^\gamma_\alpha\Gamma^\alpha_jG^\beta_\gamma-a^\gamma_{\overline{p}}G^\beta_\gamma\Gamma^p_j-a^\gamma_{\overline{\alpha}}G^\beta_\gamma L^\alpha_j-a^{\overline{i}}_j\Gamma^\beta_i$$
$$-a^{\overline{i}}_\alpha\Gamma^\alpha_j\Gamma^\beta_i-a^{\overline{i}}_{\overline{p}}\Gamma^p_j\Gamma^\beta_i-a^{\overline{i}}_{\overline{\alpha}}L^\alpha_j\Gamma^\beta_i+a^{\overline{\beta}}_\alpha\Gamma^\alpha_j+a^{\overline{\beta}}_{\overline{p}}\Gamma^p_j+a^{\overline{\beta}}_{\overline{\alpha}}L^\alpha_j)dx^j\otimes\frac{\partial}{\partial z^\beta}$$
$$+(a^i_\beta+a^i_{\overline{\gamma}}G^\gamma_\beta)dy^\beta\otimes\frac{\partial}{\partial x^i}+(a^\alpha_\beta-a^i_\beta\Gamma^\alpha_i-a^i_{\overline{\gamma}}\Gamma^\alpha_iG^\gamma_\beta$$
$$+a^\alpha_{\overline{\gamma}}G^\gamma_\beta)dy^\beta\otimes\frac{\partial}{\partial y^\alpha}+(a^{\overline{i}}_\alpha-a^k_\alpha\Gamma^i_k-a^k_{\overline{\gamma}}\Gamma^i_kG^\gamma_\alpha+a^{\overline{i}}_{\overline{\gamma}}G^\gamma_\alpha)dy^\alpha\otimes\frac{\partial}{\partial y^i}+(a^{\overline{\beta}}_\alpha-a^i_\alpha C^\beta_i$$
$$-a^\gamma_\alpha G^\beta_\gamma-a^i_{\overline{\gamma}}C^\beta_iG^\gamma_\alpha-a^\delta_{\overline{\gamma}}G^\beta_\delta G^\gamma_\alpha-a^{\overline{i}}_\alpha\Gamma^\beta_i-a^{\overline{i}}_{\overline{\gamma}}G^\gamma_\alpha\Gamma^\beta_i+a^{\overline{\beta}}_{\overline{\gamma}}G^\gamma_\alpha)dy^\alpha\otimes\frac{\partial}{\partial z^\beta}+(a^{\overline{i}}_{\overline{p}}+a^i_{\overline{\gamma}}\Gamma^\gamma_p)dy^p\otimes\frac{\partial}{\partial x^i}$$
$$+(a^\alpha_{\overline{p}}-a^i_{\overline{p}}\Gamma^\alpha_i-a^i_{\overline{\gamma}}\Gamma^\alpha_i\Gamma^\gamma_p+a^\alpha_{\overline{\beta}}\Gamma^\beta_p)dy^p\otimes\frac{\partial}{\partial y^\alpha}+(a^{\overline{i}}_{\overline{p}}-a^k_{\overline{p}}\Gamma^i_k-a^k_{\overline{\gamma}}\Gamma^i_k\Gamma^\gamma_p$$
$$+a^{\overline{i}}_{\overline{\alpha}}\Gamma^\alpha_p)dy^p\otimes\frac{\partial}{\partial y^i}+(a^{\overline{\alpha}}_{\overline{p}}-a^i_{\overline{p}}C^\alpha_i-a^i_{\overline{\gamma}}C^\alpha_i\Gamma^\gamma_p-a^\beta_{\overline{p}}G^\alpha_\beta-a^\beta_{\overline{\gamma}}G^\alpha_\beta\Gamma^\gamma_p-a^{\overline{i}}_{\overline{p}}\Gamma^\alpha_i+a^{\overline{\alpha}}_{\overline{\gamma}}\Gamma^\gamma_p$$
$$-a^{\overline{i}}_{\overline{\gamma}}\Gamma^\gamma_p\Gamma^\gamma_i)dy^p\otimes\frac{\partial}{\partial z^\alpha}+(a^\beta_{\overline{\alpha}}-a^i_{\overline{\alpha}}\Gamma^\beta_i)dz^\alpha\otimes\frac{\partial}{\partial y^\beta}+(a^{\overline{i}}_{\overline{\alpha}}-a^k_{\overline{\alpha}}\Gamma^\alpha_k)dz^\alpha\otimes\frac{\partial}{\partial y^i}$$
$$+a^i_{\overline{\alpha}}dz^\alpha\otimes\frac{\partial}{\partial x^i}+(a^{\overline{\beta}}_{\overline{\alpha}}-a^i_{\overline{\alpha}}C^\beta_i-a^\gamma_{\overline{\alpha}}G^\beta_\gamma-a^{\overline{i}}_{\overline{\alpha}}\Gamma^\beta_i)dz^\alpha\otimes\frac{\partial}{\partial z^\beta}.$$

Since the values $a^i_j, a^i_\alpha, \dots, a^{\overline{i}}_{\overline{\beta}}\overline{\alpha}$ are the tensors with respect to the group $GL(n,R)$, $GL(m,R)$, $GL(m,n,R)$ we find that the completely definite choice of sixteen tensors a^i_j, a^i_α, $a^i_{\overline{j}}$, $a^i_{\overline{\alpha}}$, a^α_i, a^α_β, is associated to the completely definite tensor T^A_B with respect to the first differential group $GL(2n,2m,R)$ of the space $T(Lm(Vn))$ as follows:

$$\begin{gathered}
T^i_j=a^i_j+a^i_\beta\Gamma^\beta_j+a_{\overline{k}^i}\Gamma^k_j+a^i_{\overline{\beta}}L^\beta_j,\;\; T^i_{\overline{\alpha}}=a^i_{\overline{\alpha}},\;\; T^i_\alpha=a^i_\alpha+a^i_{\overline{\beta}}G^\beta_\alpha,\;\; T^i_{\overline{j}}=a^i_{\overline{\gamma}}\Gamma^\gamma_j,\\
T^\alpha_j=a^\alpha_j-a^i_j\Gamma^\alpha_i-a^i_\beta\Gamma^\alpha_i\Gamma^\beta_j-a^i_{\overline{p}}\Gamma^\alpha_i\Gamma^p_j-a^i_{\overline{\gamma}}\Gamma^\alpha_iL^\gamma_j+a^\alpha_\beta\Gamma^\beta_j+a^\alpha_{\overline{p}}\Gamma^p_j+a^\alpha_{\overline{\beta}}L^\beta_j,\\
T^\alpha_\beta=a^\alpha_\beta-a^i_\beta\Gamma^\alpha_i-a^i_{\overline{\gamma}}\Gamma^\alpha_iG^\gamma_\beta+a^\alpha_{\overline{\gamma}}G^\gamma_\beta,\;\; T^\alpha_{\overline{j}}=a^\alpha_{\overline{j}}-a^i_{\overline{j}}\Gamma^\alpha_i-a^i_{\overline{\gamma}}\Gamma^\alpha_i\Gamma^\gamma_j+a^\alpha_{\overline{\gamma}}\Gamma^\beta_j,\\
T^{\overline{i}}_j=a^{\overline{i}}_j-a^k_j\Gamma^i_k-a^k_\beta\Gamma^i_k\Gamma^\beta_j-a^k_{\overline{p}}\Gamma^i_k\Gamma^p_j-a^k_{\overline{\gamma}}\Gamma^i_kL^\gamma_j+a^{\overline{i}}_\alpha\Gamma^\alpha_j+a^{\overline{i}}_{\overline{p}}\Gamma^p_j+a^{\overline{i}}_{\overline{\alpha}}L^\alpha_j,\\
T^{\overline{\alpha}}_{\overline{\beta}}=a^{\overline{\alpha}}_{\overline{\beta}}-a^i_{\overline{\beta}}C^\alpha_i-a^\gamma_{\overline{\beta}}G^\alpha_\gamma-a^{\overline{i}}_{\overline{\beta}}\Gamma^\alpha_i,\;\; T^{\overline{i}}_\alpha=a^{\overline{i}}_\alpha-a^k_\alpha\Gamma^i_k-a^k_{\overline{\gamma}}\Gamma^i_kG^\gamma_\alpha+a^{\overline{i}}_{\overline{\gamma}}G^\gamma_\alpha,\\
T^{\overline{i}}_{\overline{j}}=a^{\overline{i}}_{\overline{j}}-a^k_{\overline{j}}\Gamma^i_k-a^k_{\overline{\gamma}}\Gamma^i_k\Gamma^\gamma_j+a^{\overline{i}}_{\overline{\alpha}}\Gamma^\alpha_j,\;\; T^{\overline{i}}_{\overline{\alpha}}=a^{\overline{i}}_{\overline{\alpha}}-a^k_{\overline{\alpha}}\Gamma^i_k,\\
T^{\overline{\alpha}}_j=a^{\overline{\alpha}}_j-a^i_jC^\alpha_i-a^i_\beta C^\alpha_i\Gamma^\beta_j-a^i_{\overline{p}}C^\alpha_i\Gamma^p_j-a^i_{\overline{\gamma}}C^\alpha_iL^\gamma_j-a^\beta_jG^\alpha_\beta-a^\gamma_{\overline{p}}G^\alpha_\gamma\Gamma^p_j-a^\gamma_\beta\Gamma^\beta_jG^\alpha_\gamma-a^\gamma_{\overline{\beta}}G^\alpha_\gamma L^\beta_j\\
-a^{\overline{i}}_j\Gamma^\alpha_i-a^{\overline{i}}_\beta\Gamma^\beta_j\Gamma^\alpha_i-a^{\overline{i}}_{\overline{p}}\Gamma^p_j\Gamma^\alpha_i-a^{\overline{i}}_{\overline{\beta}}\Gamma^\alpha_iL^\beta_j+a^{\overline{\alpha}}_\beta\Gamma^\beta_j+a^{\overline{\alpha}}_{\overline{p}}\Gamma^p_j+a^{\overline{\alpha}}_{\overline{\beta}}L^\beta_j,\\
T^{\overline{\alpha}}_\beta=a^{\overline{\alpha}}_\beta-a^i_\beta C^\alpha_i-a^i_{\overline{\gamma}}C^\alpha_iG^\gamma_\beta-a^\gamma_\beta G^\alpha_\gamma-a^\delta_{\overline{\gamma}}G^\alpha_\delta G^\gamma_\beta-a^{\overline{i}}_\beta\Gamma^\alpha_i+a^{\overline{\alpha}}_{\overline{\gamma}}G^\gamma_\beta-a^{\overline{i}}_{\overline{\gamma}}G^\gamma_\beta\Gamma^\alpha_i,\\
T^{\overline{\alpha}}_{\overline{j}}=a^{\overline{\alpha}}_{\overline{j}}-a^i_{\overline{j}}C^\alpha_i-a^i_{\overline{\gamma}}C^\alpha_i\Gamma^\gamma_j-a^\beta_{\overline{j}}G^\alpha_\beta-a^\beta_{\overline{\gamma}}G^\alpha_\beta\Gamma^\gamma_j-a^{\overline{i}}_{\overline{j}}\Gamma^\alpha_i-a^{\overline{i}}_{\overline{\gamma}}\Gamma^\gamma_j\Gamma^\alpha_i+a^{\overline{\alpha}}_{\overline{\gamma}}\Gamma^\gamma_j.
\end{gathered}\tag{1}$$

Definition 1. The $GL(2n,2m,R)$-tensor field T^A_B defined by equalities (1) is called the Γ-lifting of ordered sixteen $GL(n,R)$, $GL(m,R)$, $GL(n,m,R)$-tensor fields $a^i_j, \dots, a^{\overline{\alpha}}_{\overline{\beta}}$ defined on $Lm(Vn)$.

Definition 2. The space $T(Lm(Vn))$ on which is defined the tensor field satisfying conditions

$$T_B A T^B_C T^C_D + \lambda T^A_D = 0 \quad (\lambda = \pm 1) \tag{2}$$

is called the space with a F structure.

Equations (2) can be rewritten in the form

$$
\begin{aligned}
&T^i_k T^k_p T^p_j + T^i_k T^k_{\overline{p}} T^{\overline{p}}_j + T^i_k T^k_\alpha T^\alpha_j + T^i_k T^k_{\overline{\alpha}} T^{\overline{\alpha}}_j + T^i_{\overline{k}} T^{\overline{k}}_p T^p_j + T^i_{\overline{k}} T^{\overline{k}}_\alpha T^\alpha_j + T^i_{\overline{k}} T^{\overline{k}}_{\overline{\alpha}} T^{\overline{\alpha}}_j \\
&+T^i_\alpha T^\alpha_p T^p_j + T^i_\alpha T^\alpha_{\overline{p}} T^{\overline{p}}_j + T^i_\alpha T^\alpha_\beta T^\beta_j + T^i_\alpha T^\alpha_{\overline{\beta}} T^{\overline{\beta}}_j + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_p T^p_j + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_p T^{\overline{p}}_j + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{\beta}} T^\beta_j + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{\beta}} T^{\overline{\beta}}_j + \lambda T^i_j = 0, \\
&T^k_i T^k_p T^p_j + T^i_k T^k_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^i_k T^k_\alpha T^\alpha_j + T^i_k T^k_{\overline{\alpha}} T^{\overline{\alpha}}_j + T^i_{\overline{k}} T^{\overline{k}}_p T^p_{\overline{j}} + T^i_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^i_{\overline{k}} T^{\overline{k}}_\alpha T^\alpha_{\overline{j}} + T^i_{\overline{k}} T^{\overline{k}}_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{j}} \\
&+T^i_\alpha T^\alpha_p T^p_{\overline{j}} + T^i_\alpha T^\alpha_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^i_\alpha T^\alpha_\beta T^\beta_{\overline{j}} + T^i_\alpha T^\alpha_{\overline{\beta}} T^{\overline{\beta}}_{\overline{j}} + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_p T^p_{\overline{j}} + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_\beta T^\beta_j + T^i_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{\beta}} T^{\overline{\beta}}_j + \lambda T^i_{\overline{j}} = 0, \\
&T^i_k T^k_p T^p_\alpha + T^i_k T^k_{\overline{p}} T^{\overline{p}}_\alpha + T^i_k T^k_\beta T^\beta_\alpha + T^i_k T^k_{\overline{\beta}} T^{\overline{\beta}}_\alpha + T^i_{\overline{k}} T^{\overline{k}}_p T^p_\alpha + T^i_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_\alpha + T^i_{\overline{k}} T^{\overline{k}}_\beta T^\beta_\alpha + T^i_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_\alpha \\
&+T^i_\beta T^\beta_p T^p_\alpha + T^i_\beta T^\beta_{\overline{p}} T^{\overline{p}}_\alpha + T^i_\gamma T^\gamma_\beta T^\beta_\alpha + T^i_\gamma T^\gamma_{\overline{\beta}} T^{\overline{\beta}}_\alpha + T^i_{\overline{\beta}} T^{\overline{\beta}}_p T^p_\alpha + T^i_{\overline{\beta}} T^{\overline{\beta}}_{\overline{p}} T^{\overline{p}}_\alpha + T^i_{\overline{\gamma}} T^{\overline{\gamma}}_\beta T^\beta_\alpha + T^i_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{\beta}} T^{\overline{\beta}}_\alpha + \lambda T^i_\alpha = 0, \\
&T^i_k T^k_p T^p_{\overline{\alpha}} + T^i_k T^k_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^i_k T^k_\beta T^\beta_{\overline{\alpha}} + T^i_k T^k_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} + T^i_{\overline{k}} T^{\overline{k}}_p T^p_{\overline{\alpha}} + T^i_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^i_{\overline{k}} T^{\overline{k}}_\beta T^\beta_{\overline{\alpha}} + T^i_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} \\
&+T^i_\beta T^\beta_p T^p_{\overline{\alpha}} + T^i_\beta T^\beta_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^i_\gamma T^\gamma_\beta T^\beta_{\overline{\alpha}} + T^i_\gamma T^\gamma_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} + T^i_{\overline{\beta}} T^{\overline{\beta}}_p T^p_{\overline{\alpha}} + T^i_{\overline{\beta}} T^{\overline{\beta}}_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^i_{\overline{\gamma}} T^{\overline{\gamma}}_\beta T^\beta_{\overline{\alpha}} + T^i_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} + \lambda T^i_{\overline{\alpha}} = 0, \\
&T^{\overline{i}}_k T^k_p T^p_j + T^{\overline{i}}_k T^k_{\overline{p}} T^{\overline{p}}_j + T^{\overline{i}}_k T^k_\alpha T^\alpha_j + T^{\overline{i}}_k T^k_{\overline{\alpha}} T^{\overline{\alpha}}_j + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_p T^p_j + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_j + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_\alpha T^\alpha_j + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{\alpha}} T^{\overline{\alpha}}_j \\
&+T^{\overline{i}}_\alpha T^\alpha_p T^p_j + T^{\overline{i}}_\alpha T^\alpha_{\overline{p}} T^{\overline{p}}_j + T^{\overline{i}}_\alpha T^\alpha_\beta T^\beta_j + T^{\overline{i}}_\alpha T^\alpha_{\overline{\beta}} T^{\overline{\beta}}_j + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_p T^p_j + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{p}} T^{\overline{p}}_j + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_\beta T^\beta_j + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{\beta}} T^{\overline{\beta}}_j + \lambda T^{\overline{i}}_j = 0, \\
&T^{\overline{i}}_k T^k_p T^p_{\overline{j}} + T^{\overline{i}}_k T^k_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^{\overline{i}}_k T^k_\alpha T^\alpha_{\overline{j}} + T^{\overline{i}}_k T^k_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{j}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_p T^p_{\overline{j}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_\alpha T^\alpha_{\overline{j}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{j}} \\
&+T^{\overline{i}}_\alpha T^\alpha_p T^p_{\overline{j}} + T^{\overline{i}}_\alpha T^\alpha_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^{\overline{i}}_\alpha T^\alpha_\beta T^\beta_{\overline{j}} + T^{\overline{i}}_\alpha T^\alpha_{\overline{\beta}} T^{\overline{\beta}}_{\overline{j}} + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_p T^p_{\overline{j}} + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_\beta T^\beta_{\overline{j}} + T^{\overline{i}}_{\overline{\alpha}} T^{\overline{\alpha}}_{\overline{\beta}} T_{\overline{j}^{\overline{\beta}}} + \lambda T^{\overline{i}}_{\overline{j}} = 0, \\
&T^{\overline{i}}_k T^k_p T^p_\alpha + T^{\overline{i}}_k T^k_{\overline{p}} T^{\overline{p}}_\alpha + T^{\overline{i}}_k T^k_\beta T^\beta_\alpha + T^{\overline{i}}_k T^k_{\overline{\beta}} T^{\overline{\beta}}_\alpha + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_p T^p_\alpha + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_\alpha + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_\beta T^\beta_\alpha + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_\alpha \\
&+T^{\overline{i}}_\beta T^\beta_p T^p_\alpha + T^{\overline{i}}_\beta T^\beta_{\overline{p}} T^{\overline{p}}_\alpha + T^{\overline{i}}_\gamma T^\gamma_\beta T^\beta_\alpha + T^{\overline{i}}_\gamma T^\gamma_{\overline{\beta}} T^{\overline{\beta}}_\alpha + T^{\overline{i}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{p}} T^p_\alpha + T^{\overline{i}}_{\overline{\gamma}} T^{\overline{\gamma}}_\beta T^\beta_\alpha + T^{\overline{i}}_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{\beta}} T^{\overline{\beta}}_\alpha + \lambda T^{\overline{i}}_\alpha = 0, \\
&T^{\overline{i}}_k T^k_p T^p_{\overline{\alpha}} + T^{\overline{i}}_k T^k_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^{\overline{i}}_k T^k_\beta T^\beta_{\overline{\alpha}} + T^{\overline{i}}_k T^k_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_p T^p_{\overline{\alpha}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_\beta T^\beta_{\overline{\alpha}} + T^{\overline{i}}_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} + T^{\overline{i}}_\beta T^\beta_p T^p_{\overline{\alpha}} \\
&+T^{\overline{i}}_\beta T^\beta_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^{\overline{i}}_\gamma T^\gamma_\beta T^\beta_{\overline{\alpha}} + T^{\overline{i}}_\gamma T^\gamma_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} + T^{\overline{i}}_{\overline{\beta}} T^{\overline{\beta}}_p T^p_{\overline{\alpha}} + T^{\overline{i}}_{\overline{\beta}} T^\beta_{\overline{p}} T^{\overline{p}}_{\overline{\alpha}} + T^{\overline{i}}_{\overline{\gamma}} T^{\overline{\gamma}}_\beta T^\beta_{\overline{\alpha}} + T^{\overline{i}}_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\alpha}} + \lambda T^{\overline{i}}_{\overline{\alpha}} = 0, \\
&T^\alpha_k T^k_p T^p_j + T^\alpha_k T^k_{\overline{p}} T^{\overline{p}}_j + T^\alpha_k T^k_\beta T^\beta_j + T^\alpha_k T^k_{\overline{\beta}} T^{\overline{\beta}}_j + T^\alpha_{\overline{k}} T^{\overline{k}}_p T^p_j + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_j + T^\alpha_{\overline{k}} T^{\overline{k}}_\beta T^\beta_j + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_j \\
&+T^\alpha_\beta T^\beta_p T^p_j + T^\alpha_\beta T^\beta_{\overline{p}} T^{\overline{p}}_j + T^\alpha_\gamma T^\gamma_\beta T^\beta_j + T^\alpha_\gamma T^\gamma_{\overline{\beta}} T^{\overline{\beta}}_j + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_p T^p_j + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{p}} T^{\overline{p}}_j + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_\beta T^\beta_j + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{\beta}} T^{\overline{\beta}}_j + \lambda T^\alpha_j = 0, \\
&T^\alpha_k T^k_p T^p_{\overline{j}} + T^\alpha_k T^k_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^\alpha_k T^k_\beta T^\beta_{\overline{j}} + T^\alpha_k T^k_{\overline{\beta}} T^{\overline{\beta}}_{\overline{j}} + T^\alpha_{\overline{k}} T^{\overline{k}}_p T^p_{\overline{j}} + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^\alpha_{\overline{k}} T^{\overline{k}}_\beta T^\beta_{\overline{j}} + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{j}} \\
&+T^\alpha_\beta T^\beta_p T^p_{\overline{j}} + T^\alpha_\beta T^\beta_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^\alpha_\gamma T^\gamma_\beta T^\beta_{\overline{j}} + T^\alpha_\gamma T^\gamma_{\overline{\beta}} T^{\overline{\beta}}_{\overline{j}} + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_p T^p_{\overline{j}} + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{p}} T^{\overline{p}}_{\overline{j}} + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_\beta T^\beta_{\overline{j}} + T^\alpha_{\overline{\gamma}} T^{\overline{\gamma}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{j}} + \lambda T^\alpha_{\overline{j}} = 0, \\
&T^\alpha_k T^k_p T^p_\gamma + T^\alpha_k T^k_{\overline{p}} T^{\overline{p}}_\gamma + T^\alpha_k T^k_\beta T^\beta_\gamma + T^\alpha_k T^k_{\overline{\beta}} T^{\overline{\beta}}_\gamma + T^\alpha_{\overline{k}} T^{\overline{k}}_p T^p_\gamma + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_\gamma + T^\alpha_{\overline{k}} T^{\overline{k}}_\beta T^\beta_\gamma + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_\gamma \\
&+T^\alpha_\beta T^\beta_p T^p_\gamma + T^\alpha_\beta T^\beta_{\overline{p}} T^{\overline{p}}_\gamma + T^\alpha_\delta T^\delta_\beta T^\beta_\gamma + T^\alpha_\delta T^\delta_{\overline{\beta}} T^{\overline{\beta}}_\gamma + T^\alpha_{\overline{\delta}} T^{\overline{\delta}}_p T^p_\gamma + T^\alpha_{\overline{\delta}} T^{\overline{\gamma}}_{\overline{p}} T^{\overline{p}}_\gamma + T^\alpha_{\overline{\delta}} T^{\overline{\delta}}_\beta T^\beta_\gamma + T^\alpha_{\overline{\delta}} T^{\overline{\delta}}_{\overline{\beta}} T^{\overline{\beta}}_\gamma + \lambda T^\alpha_\gamma = 0, \\
&T^\alpha_k T^k_p T^p_{\overline{\gamma}} + T^\alpha_k T^k_{\overline{p}} T^{\overline{p}}_{\overline{\gamma}} + T^\alpha_k T^k_\beta T^\beta_{\overline{\gamma}} + T^\alpha_k T^k_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\gamma}} + T^\alpha_{\overline{k}} T^{\overline{k}}_p T^p_{\overline{\gamma}} + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{p}} T^{\overline{p}}_{\overline{\gamma}} + T^\alpha_{\overline{k}} T^{\overline{k}}_\beta T^\beta_{\overline{\gamma}} + T^\alpha_{\overline{k}} T^{\overline{k}}_{\overline{\beta}} T^{\overline{\beta}}_{\overline{\gamma}}
\end{aligned} \tag{3}
$$

$$+T^{\alpha}_{\beta}T^{\beta}_{p}T^{p}_{\overline{\gamma}}+T^{\alpha}_{\beta}T^{\beta}_{\overline{p}}T^{\overline{p}}_{\overline{\gamma}}+T^{\alpha}_{\delta}T^{\delta}_{\beta}T^{\beta}_{\overline{\gamma}}+T^{\alpha}_{\delta}T^{\delta}_{\overline{\beta}}T^{\overline{\beta}}_{\overline{\gamma}}+T^{\alpha}_{\overline{\delta}}T^{\overline{\delta}}_{p}T^{p}_{\overline{\gamma}}+T^{\alpha}_{\overline{\delta}}T^{\overline{\gamma}}_{\overline{p}}T^{\overline{p}}_{\overline{\gamma}}+T^{\alpha}_{\overline{\delta}}T^{\overline{\delta}}_{\beta}T^{\beta}_{\overline{\gamma}}+T^{\alpha}_{\overline{\delta}}T^{\overline{\delta}}_{\overline{\beta}}T^{\overline{\beta}}_{\overline{\gamma}}+\lambda T^{\alpha}_{\overline{\gamma}}=0,$$

$$T^{\overline{\alpha}}_{k}T^{k}_{p}T^{p}_{j}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{p}}T^{\overline{p}}_{j}+T^{\overline{\alpha}}_{k}T^{k}_{\beta}T^{\beta}_{j}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{\beta}}T^{\overline{\beta}}_{j}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{p}T^{p}_{j}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{p}}T^{\overline{p}}_{j}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\beta}T^{\beta}_{j}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{\beta}}T^{\overline{\beta}}_{j}$$

$$+T^{\overline{\alpha}}_{\beta}T^{\beta}_{p}T^{p}_{j}+T^{\overline{\alpha}}_{\beta}T^{\beta}_{\overline{p}}T^{\overline{p}}_{j}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\beta}T^{\beta}_{j}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\overline{\beta}}T^{\overline{\beta}}_{j}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{p}T^{p}_{j}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{p}}T^{\overline{p}}_{j}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\beta}T^{\beta}_{j}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{\beta}}T^{\overline{\beta}}_{j}+\lambda T^{\overline{\alpha}}_{j}=0,$$

$$T^{\overline{\alpha}}_{k}T^{k}_{p}T^{p}_{\overline{j}}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{p}}T^{\overline{p}}_{\overline{j}}+T^{\overline{\alpha}}_{k}T^{k}_{\beta}T^{\beta}_{\overline{j}}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{\beta}}T^{\overline{\beta}}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{p}T^{p}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{p}}T^{\overline{p}}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\beta}T^{\beta}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{\beta}}T^{\overline{\beta}}_{\overline{j}}$$

$$+T^{\overline{\alpha}}_{\beta}T^{\beta}_{p}T^{p}_{\overline{j}}+T^{\overline{\alpha}}_{\beta}T^{\beta}_{\overline{p}}T^{\overline{p}}_{\overline{j}}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\beta}T^{\beta}_{\overline{j}}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\overline{\beta}}T^{\overline{\beta}}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{p}T^{p}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{p}}T^{\overline{p}}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\beta}T^{\beta}_{\overline{j}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{\beta}}T^{\overline{\beta}}_{\overline{j}}+\lambda T^{\overline{\alpha}}_{\overline{j}}=0,$$

$$T^{\overline{\alpha}}_{k}T^{k}_{p}T^{p}_{\beta}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{p}}T^{\overline{p}}_{\beta}+T^{\overline{\alpha}}_{k}T^{k}_{\gamma}T^{\gamma}_{\beta}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{\gamma}}T^{\overline{\gamma}}_{\beta}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{p}T^{p}_{\beta}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{p}}T^{\overline{p}}_{\beta}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\gamma}T^{\gamma}_{\beta}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\beta}$$

$$+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{p}T^{p}_{\beta}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\overline{p}}T^{\overline{p}}_{\beta}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\delta}T^{\delta}_{\beta}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\overline{\delta}}T^{\overline{\delta}}_{\beta}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{p}T^{p}_{\beta}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{p}}T^{\overline{p}}_{\beta}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\delta}T^{\delta}_{\beta}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{\delta}}T^{\overline{\delta}}_{\beta}+\lambda T^{\overline{\alpha}}_{\beta}=0,$$

$$T^{\overline{\alpha}}_{k}T^{k}_{p}T^{p}_{\overline{\beta}}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{p}}T^{\overline{p}}_{\overline{\beta}}+T^{\overline{\alpha}}_{k}T^{k}_{\gamma}T^{\gamma}_{\overline{\beta}}+T^{\overline{\alpha}}_{k}T^{k}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{p}T^{p}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{p}}T^{\overline{p}}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\gamma}T^{\gamma}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{k}}T^{\overline{k}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{\beta}}$$

$$+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{p}T^{p}_{\overline{\beta}}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\overline{p}}T^{\overline{p}}_{\overline{\beta}}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\delta}T^{\delta}_{\overline{\beta}}+T^{\overline{\alpha}}_{\gamma}T^{\gamma}_{\overline{\delta}}T^{\overline{\delta}}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{p}T^{p}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{p}}T^{\overline{p}}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\delta}T^{\delta}_{\overline{\beta}}+T^{\overline{\alpha}}_{\overline{\gamma}}T^{\overline{\gamma}}_{\overline{\delta}}T^{\overline{\delta}}_{\overline{\beta}}+\lambda T^{\overline{\alpha}}_{\overline{\beta}}=0.$$

Consider the case in which

$$a^{i}_{\alpha}=a^{i}_{\overline{j}}=a^{i}_{\overline{\alpha}}=a^{\alpha}_{i}=a^{\alpha}_{\overline{\beta}}=a^{\overline{i}}_{j}=a^{\overline{i}}_{\alpha}=a^{\overline{\alpha}}_{i}=a^{\overline{\alpha}}_{\beta}=a^{\overline{\alpha}}_{\overline{i}}=0,$$
$$a^{i}_{j}=a\delta^{i}_{j},\quad a^{\alpha}_{\beta}=c\delta^{\alpha}_{\beta},\quad a^{\overline{i}}_{\overline{j}}=b\delta^{i}_{j},\quad a^{\overline{\alpha}}_{\overline{\beta}}=a\delta^{\alpha}_{\beta}.$$

In this case, the tensors a^{i}_{j}, a^{α}_{β} can be associated with the tensor T^{A}_{B} as follows:

$$T^{i}_{j}=a\delta^{i}_{j},\quad T^{i}_{\alpha}=0,\quad T^{i}_{\overline{j}}=0,\quad T^{\alpha}_{i}=(c-a)\Gamma^{\alpha}_{i},\quad T^{\alpha}_{\beta}=c\delta^{\alpha}_{\beta},\quad T^{\alpha}_{\overline{i}}=0,\quad T^{\alpha}_{\overline{\beta}}=0,$$
$$T^{\overline{i}}_{j}=(b-a)\Gamma^{i}_{j},\quad T^{\overline{i}}_{\alpha}=0,\quad T^{\overline{i}}_{\overline{j}}=0,\quad T^{\overline{\alpha}}_{\beta}=(d-c)\Gamma^{\alpha}_{k},$$
$$T^{\overline{\alpha}}_{k}=-aC^{\alpha}_{k}-c\Gamma^{\gamma}_{k}\Gamma^{\alpha}_{\gamma}-b\Gamma^{i}_{k}\Gamma^{\alpha}_{i}+dL^{\alpha}_{k},\quad T^{\overline{\alpha}}_{\overline{\beta}}=d\delta^{\alpha}_{\beta}.$$

Equalities (3) imply that

$$(b-a)(a^{2}+ab+b^{2}+\lambda)=0,\quad a(a^{2}+\lambda)=0,$$
$$(c-a)(a^{2}+ac+c^{2}+\lambda)=0,\quad c(c^{2}+\lambda)=0,$$
$$(d-c)(c^{2}+cd+d^{2}+\lambda)=0,\quad d(d^{2}+\lambda)=0,$$
$$(d-b)(b^{2}+bd+d^{2}+\lambda)=0,\quad b(b^{2}+\lambda)=0,$$
$$(a^{2}+ad+d^{2}+\lambda)(-aC^{\alpha}_{i}-c\Gamma^{\lambda}_{i}\Gamma^{\alpha}_{\beta}-b\Gamma^{k}_{i}\Gamma^{\alpha}_{k}+dL^{\alpha}_{i})$$
$$+(a+b+d)(b-a)(d-b)\Gamma^{\alpha}_{k}\Gamma^{k}_{i}+(a+c+d)(d-c)(c-a)\Gamma^{\alpha}_{\gamma}\Gamma^{\gamma}_{i}.$$

It follows that

$$a^{2}+\lambda=0,\quad c^{2}+\lambda=0\quad d^{2}+\lambda=0,\quad b^{2}+\lambda=0.$$

Similar results are obtained for other cases. Thus, we have proved the following theorem:

Theorem. *In the tangent $T(Lm(Vn))$ space a real-valued F structures exist only for $\lambda=-1$.*

References

1. G. Todua, On internal tensor structures of the tangent bundle of space $L_m(V_n)$ with a triplet connection. *Bull. Georgian Natl. Acad. Sci.* **173** (2006), no. 1, 22–25.
2. G. Todua, Lifts. On tensor structures. *Trans. A. Razmadze Math. Inst.* **170** (2016), no. 2, 272–279.
3. G. Todua, On the internal tensor structures of the fibration $T(\mathrm{Lm}(Vn))$. *Trans. A. Razmadze Math. Inst.* **172** (2018), no. 1, 126–132.

4. G. Todua, On the vector fiber surface of the space Lm(Vn) of triplet connectedness. *Trans. A. Razmadze Math. Inst.* **174** (2020), no. 3, 377–379.

(Received 21.12.2020)

European University, 76 Guramishvili Avenue, Tbilisi 0141, Georgia
E-mail address: todua.gocha@eu.edu.ge