As argued in paper 137 the homogeneous field equation is the Lorentz field equation with $\Lambda = \Gamma$. The Jones equation is built up from:

$$\rho \mu_{\nu} = \partial_{\nu} V^\mu + \Gamma^\mu_{\nu}, \quad (1)$$

$$\rho \mu_{\nu} = \mu \nu + \gamma_{\mu \nu} V^\nu, \quad (2)$$

which includes the tetrad postulate:

$$\rho \mu_{\nu} = \partial_{\nu} V^\mu + \Gamma^\mu_{\nu}, \quad (3)$$

$$\rho \mu_{\nu} = \partial_{\nu} V^\mu + \Gamma^\mu_{\nu} + \Gamma^\mu_{\nu}, \quad (4)$$

If the covariant $\Gamma^\mu_{\nu}$ is changed to:

$$\Lambda^\mu_{\nu} = \Gamma^\mu_{\nu}, \quad (5)$$

then the spin connection in Eq. (4) is also changed to:

$$\Omega^\mu_{\nu} = \partial_{\nu} V^\mu + \Gamma^\mu_{\nu}, \quad (6)$$

So spin connection in the homogeneous field
Equation is different from that of the Lorentz field equation. Therefore the HFE is:

$$d \wedge F^a = J^a = A^{(0)}(R^a_b \wedge q^b - \omega^a_b \wedge T^b)$$

and the IFE is:

$$d \wedge F^a = J^a = A^{(0)}(\bar{R}^a_b \wedge q^b - \bar{\omega}^a_b \wedge \bar{T}^b)$$

where

$$F^a = d \wedge A^a + \omega^a_b \wedge A^b$$

Magnetic Monopole and Magneticity

These phenomena are described by:

$$d \wedge F^a = j^a$$

i.e.

$$\nabla \cdot B^a = c j^0$$

$$\nabla \times E^a + \frac{d B^a}{dt} = j$$

In the standard model:

$$j^0 = 0$$

$$j^i = 0$$

In ECE, the existence of a magnetic monopole implies the existence of a magnetic
Current \( j \) are described by

\[ R^{a b} \nabla_\mu \gamma^\nu = \omega^{a b} \nabla^\mu \gamma^\nu - (15) \]

i.e.

\[ \omega^{a b} + \kappa \epsilon^{a b c} \gamma^c = - (16) \]

As shown in previous work, the existence of the circular magnetic current \( j \) implies that the circular polarization of light is changed as it passes a massive object.

The inhomogeneous \( j^a \)

This is defined by the interaction of the electromagnetic field with matter, i.e. by the Coulomb law and the Ampère-Maxwell law:

\[ \nabla \cdot E^a = \rho^a / \epsilon_0 \quad - (17) \]

\[ \nabla \times B^a = \mu_0 \mu_0 \nabla \times E^a - \mu_0 j^a \quad - (18) \]

for each polarization component.

This means that

\[ R^{a b} \nabla_\mu \gamma^\nu = \omega^{a b} \nabla^\mu \gamma^\nu - (19) \]
Write the Fermi postulate as:
\[ \Gamma_{\mu\nu} = \partial_{\mu} \sqrt{\rho} + \omega_{\mu} \quad - (1) \]

then:
\[ \Lambda_{\mu\nu} = \Gamma_{\mu\nu} = (\partial_{\mu} \sqrt{\rho}) \Theta_{\rho} + \omega_{\mu} \quad - (2) \]

where the \( \| \Theta \| \) factors cancel out.

Define:
\[ \partial_{\mu} \sqrt{\rho} + \omega_{\mu} = (\partial_{\mu} \sqrt{\rho}) \Theta_{\rho} + \frac{\omega}{2} \quad - (3) \]

then:
\[ \Omega_{\mu\nu} = (\partial_{\mu} \sqrt{\rho}) \Theta_{\rho} - \partial_{\mu} \sqrt{\rho} + \omega_{\mu} \quad - (4) \]

and
\[ \Lambda_{\mu\nu} = \partial_{\mu} \sqrt{\rho} + \Omega_{\mu\nu} \quad - (5) \]

The Cartan-Ehresmann dual identity is therefore:
\[ D_{\mu} T_{\lambda\rho} = R_{\lambda\rho\mu} \quad - (6) \]

\[ \text{i.e.} \]
\[ \dot{J}^a_{\mu\nu} = J^a_{\mu\nu} - (7) \]

\[ J^a_{\mu\nu} = R^a_{\mu\nu} - \omega^{a}_{\mu\nu} T^b_{\mu\nu} - (8) \]

The inhomogeneous field equation of $\mathcal{E}/\mathcal{N}$ is:

\[ \dot{F}^a_{\mu\nu} = A^{(a)} J^a_{\mu\nu} - (9) \]

The spin connection in the inhomogeneous field equation is:

\[ \Omega^a_{\mu\nu} = -\Omega^a_{\mu\nu} - (10) \]

The homogeneous field equation of $\mathcal{E}/\mathcal{N}$ is:

\[ \dot{F}^a_{\mu\nu} = A^{(a)} j^a_{\mu\nu} - (11) \]

where

\[ j^a_{\mu\nu} = A^{(a)} \left( R^a_{\mu\nu} - \omega^{a}_{\mu\nu} T^b_{\mu\nu} \right) - (12) \]

The existence of the magnetic charge
current density $j^a$ is defined by the geometry of eq. (12).

**Vector Notation**

In the absence of polarization and magnetization, eq. (9) gives

$$\nabla \cdot E^a = \rho / \varepsilon_0$$

which is the **Continuity Law** for each polarization.

Eq. (9) also gives

$$\nabla \times B^a = \mu_0 J^a$$

which is the **Ampère-Maxwell Law** for each $a$.

Eq. (11) gives:

$$\nabla \cdot B^a = \mu_0 \rho_m$$

which is the **Gauss Law with Magnetic Monopole** $\rho_m$ for each $a$. (Eq. 11) also

$$\nabla \times E^a + \mu_0 \frac{\partial B^a}{\partial t} = \mu_0 \rho_m$$

$$- (16)$$
4) Which is the Faraday Law with magnetic current $i_m$ for each $a$.

The prediction of eq. (16) in ECE was made several years ago. It has been shown that eq. (16) describes the experimentally observed change of polarization of light passing a liquid mass.

Magnetic monopoles (charges) are described by eq. (15), and magnetic currents by eq. (16).
The flaw is "The First Bianchi Identity"

The "First Bianchi Identity" of the standard model is

\[ R \wedge \varphi = 0. \quad (1) \]

In the notation of differential geometry, this is:

\[ R^a \wedge \varphi_b = 0. \quad (2) \]

In tensor notation this is:

\[ R^a \wedge \varphi_b + R^b \wedge \varphi_a + R^c \wedge \varphi_{ac} = 0. \quad (3) \]

Eq. (3) can be rewritten for the wedge product of a two-form and a one-form (\( \omega \) \( \varphi \)) (see Carroll). The usual format is:

\[ R^a \wedge \varphi_b + R^b \wedge \varphi_a + R^c \wedge \varphi_{ac} = 0. \quad (4) \]

As should be well known by now, eq. (4) is not an identity at all. It is true if identity is given not in the sense of Cartan and is:

\[ R \wedge \varphi = 0. \quad (5) \]

In tensor notation, eq. (5) can be written as:

\[ D_a T^{\mu \nu} + D_\mu T^{a \nu} + D_\nu T^{a \mu} = 0. \quad (6) \]
As proven on page 102 eq. (6) is the cyclic sum of the right hand side identically equal to the right hand side of eq. (6). The definition of each of the term is due to tensors. Cartan derived an exact identity. It is not clear that Bianchi derived eq. (4)

\[ T_{\mu \nu} = \Gamma_{\mu \nu} - \Gamma_{\nu \mu} \]  

Eq. (6) follows from the fundamental commutator equation:  

\[ [D_{\mu}, D_{\nu}] V^\rho = R^{\rho}_{\mu \nu \sigma} V^\sigma - T^{\rho}_{\mu \nu} \]  

Eq. (7) also follows from eq. (8). Written out more fully, eq. (8) is:  

\[ [D_{\mu}, D_{\nu}] V^\rho = - (\Gamma_{\mu \nu} - \Gamma_{\nu \mu}) D_\chi V^\rho + R^{\rho}_{\mu \nu \sigma} V^\sigma \]  

\[ \text{Therefore:} \quad [D_{\mu}, D_{\nu}] V^\rho = \Gamma_{\mu \nu} D_\chi V^\rho + \ldots \]  

By definition:
3) \[ [D_\mu, D_\nu] := -[D_\nu, D_\mu] \] (11)

so far eq. (10):

\[
\Gamma^\lambda_{\mu\nu} = -\Gamma^\lambda_{\nu\mu}
\] (12)

Note carefully that:

\[
\Gamma^\lambda_{\mu\nu} = \Gamma^\lambda_{\nu\mu} \] (13)

then:

\[ [D_\mu, D_\nu] = 0 = (14) \]

and:

\[
\Gamma^\lambda_{\mu\nu} = 0
\] (15)

Also, if eq. (13) is used:

\[
R^\lambda_{\mu\nu\rho} = 0 \] (16)

\[
\Gamma^\lambda_{\mu\nu} = 0 \] (17)

Recall if eq. (13) is used:

\[
0 = 0
\] (18)

The Standard Model Error:

The error in the standard model of cosmology is catastrophic, and is eq. (13).
4) The error (13) works its way through the entire mechanics of general relativity, the major equation of which fail catastrophically. Notably:

\begin{equation}
\Gamma^\nu_{\mu\nu} = \frac{1}{2} g^\nu_{\rho} \left( g_{\mu\rho p} \Gamma^p_{\nu\mu} + 2 g_{\mu\rho} \Gamma^p_{\nu\rho} - 2 g_{\nu\rho} \Gamma^p_{\mu\rho} \right)
\end{equation}

So we see that text that we an equation are unreliable.

2) The connection of the standard cosmology is

\begin{equation}
\Gamma^\lambda_{\mu\nu} = \Gamma^\nu_{\mu\lambda}
\end{equation}

This is incorrect for eq. (10). Eq. (19) is true if and only if eq. (20) is true.

3) The standard cosmology was:

\begin{equation}
T^\lambda_{\mu\nu} = 0
\end{equation}

and at the same time was

\begin{equation}
R \Gamma^\mu_{\rho\nu} = 0
\end{equation}

This is correct for eq. (18). If it's torsion is zero so it is curvature.
The second Bianchi identity of the standard model is again incorrect because of the vacuum anomaly. In split form, the second Bianchi identity is:

\[ D\alpha R = 0 \quad - (1) \]

and in the notation of differential geometry it is:

\[ D\alpha R^{ab} = 0 \quad - (2) \]

Eq. (2) may so be expanded out as:

\[ d\alpha R^{ab} + d\omega c R^{ca} b - R^{ca} d\omega b = 0 \quad - (3) \]

In tensor notation, it is:

\[ d\alpha R^{\mu\nu} + d\omega c R^{c\mu} \nu - R^{c\mu} d\omega \nu = 0 \quad - (4) \]

(Carroll, eq. (3.67) of notes)

However, eq. (4) is true only if:

\[ \Gamma^\mu_{\nu\rho} = \Gamma^\rho_{\mu\nu} \quad - (5) \]

In which case:

\[ R^{\mu\nu} = 0 \quad - (6) \]

So eq. (4) means:

\[ 0 = 0 \quad - (7) \]

As Carroll mentions on page 81 of his notes, notice that for a general connection, there would be additional terms in the torsion tensor.

In paper 88 E. the second Bianchi
identity was given:

$$\nabla (\nabla \tau) = \nabla (\nabla \tau_{\text{R}}) - (8)$$

which is derived by taking the right side of the Cartesian identity:

$$\nabla \tau = \nabla \tau_{\text{R}} - (9)$$

Note carefully that Carroll does not realize that:

$$\Gamma^\lambda_{\mu\nu} = - \Gamma^\lambda_{\nu\mu} - (10)$$

and does not realize that there is no symmetric part to the connection. In cases where Carroll is erroneous, however, pure geometry in his chapter are to be corrected.

Albert Einstein used the erroneous eq. (4) in the format:

$$\nabla \nabla g_{\mu\nu} = 0 - (11)$$

where

$$g_{\mu\nu} = R_{\mu\nu} - \frac{1}{2} R g_{\mu\nu} - (12)$$

where:

$$R_{\mu\nu} = R_{\mu\nu} - (13)$$

$$\nabla g_{\mu\nu} = \nabla g_{\mu\nu} - (14)$$

The erroneous Einstein field equation is
Based on making eq. (11) proportional to the covariant Noether theorem.

\[ D \cdot T_\mu = 0. \quad (15) \]

So:

\[ D \cdot \delta \mu = k D \cdot T_\mu \quad (16) \]

where \( k \) is Euler's constant. The field equation is a particular solution:

\[ \delta \mu = k T_\mu. \quad (17) \]

However, eq. (17) assume the erroneous

However, eq. (17) assume the erroneous

Thus, the correct field equation produces

\[ \delta \mu = 0. \quad (18) \]

The correct field equation is:

\[ D \cdot T_\mu = R \cdot \nabla \cdot T \quad (19) \]

ECE field equation is:

\[ D \cdot T_\mu = R \cdot \nabla \cdot T \quad (20) \]

\[ D \cdot T_\mu = \overline{R} \cdot \nabla \cdot T \quad (21) \]
Standard Model

The first Bianchi identity is:

\[ R^\mu_{\rho\sigma\nu} + R^\nu_{\rho\sigma\mu} + R^\sigma_{\rho\nu\mu} = 0 \quad (1) \]

Because it is assumed that:

\[ \Gamma^\lambda_{\mu\nu} = \Gamma^\lambda_{\nu\mu} \quad (2) \]

Thus:

\[ DoR^\mu_{\rho\sigma\nu} + DoR^\nu_{\rho\sigma\mu} + DoR^\sigma_{\rho\nu\mu} = 0 \quad (3) \]

Similarly:

\[ R^\nu_{\rho\sigma\nu} + R^\nu_{\rho\sigma\nu} + R^\sigma_{\rho\nu\nu} = 0 \quad (4) \]

and

\[ DoR^\nu_{\rho\sigma\nu} + DoR^\sigma_{\rho\nu\nu} = 0 \quad (5) \]

Thirdly:

\[ R^\rho_{\nu\sigma\rho} + R^\rho_{\nu\sigma\rho} + R^\sigma_{\nu\rho\rho} = 0 \quad (6) \]

and

\[ DoR^\rho_{\nu\sigma\rho} + DoR^\sigma_{\nu\rho\rho} = 0 \quad (7) \]

Add (3), (5) and (7):

\[ DoR^\mu_{\rho\sigma\nu} + DoR^\nu_{\rho\sigma\mu} + DoR^\sigma_{\rho\nu\mu} + Do(R^\nu_{\rho\sigma\nu} + R^\sigma_{\rho\nu\nu}) + Do(R^\rho_{\nu\sigma\rho} + R^\sigma_{\nu\rho\rho}) = 0 \quad (8) \]

Finally add to self side of eq. (8):

\[ DoR^\mu_{\rho\sigma\nu} + DoR^\nu_{\rho\sigma\mu} + DoR^\sigma_{\rho\nu\mu} + DoR^\rho_{\nu\sigma\rho} + DoR^\sigma_{\nu\rho\rho} = 0 \]
\[ \frac{\partial R^\mu}{\partial x^\mu} + \frac{\partial R_\mu}{\partial x^{\mu_\rho \eta}} + \frac{\partial R^{\mu_\rho \eta}}{\partial x^{\mu}} = 0 \]  
which is the second Bianchi identity, QED.

Eqn. (9) was actually discovered by Ricci, and is true if and only if eqns. (1) and (2) are assumed.

The Correct Identity

This was first given by Cartan and is:

\[ \frac{\partial T^a}{\partial x^\rho} + \frac{\partial T^a}{\partial x^{\mu \rho}} + \frac{\partial T^a}{\partial x^{\mu}} := R^a_{\mu \rho \eta} + R^a_{\rho \eta \mu} + R^a_{\eta \mu \rho} \]  
(10)

so the correct version of eqn. (9) is:

\[ \frac{\partial R^a}{\partial x^\mu} + \frac{\partial R^a}{\partial x^{\mu_\rho \eta}} + \frac{\partial R^{a_\rho \eta}}{\partial x^{a}} := \frac{\partial}{\partial x^\rho} \frac{\partial T^a}{\partial x^{\mu}} + \frac{\partial}{\partial x^{\mu}} \frac{\partial T^a}{\partial x^{\rho}} + \frac{\partial}{\partial x^{\rho}} \frac{\partial T^a}{\partial x^{\mu}} = 0 \]  
(11)

In eqns. (10) and (11):

\[ \gamma^a_{\mu \rho} = -\gamma^a_{\rho \mu} \]

(12)
The first Cartan identity is:

\[ S^a_{\mu\rho} + S^a_{\mu\nu} + S^a_{\nu\rho} = 0 \quad - (1) \]

where

\[ S^a_{\mu\rho} = R^a_{\mu\rho} - D_n T^a_{\mu\rho} \quad - (2) \]

and so on.

Thus:

\[ D_o \left( S^a_{\mu\rho} + S^a_{\mu\nu} + S^a_{\nu\rho} \right) = 0 \quad - (3) \]
\[ D_o \left( S^a_{\rho\sigma} + S^a_{\sigma\rho} + S^a_{\sigma\rho} \right) = 0 \quad - (4) \]
\[ D_o \left( S^a_{\rho\sigma} + S^a_{\sigma\rho} + S^a_{\sigma\rho} \right) = 0 \quad - (5) \]

Add eqns. (3) to (5):

\[ D_o S^a_{\mu\rho} + D_o S^a_{\mu\rho} + D_o S^a_{\rho\sigma} \]
\[ + D_o \left( S^a_{\mu\rho} + S^a_{\mu\nu} + S^a_{\nu\rho} \right) + D_o \left( S^a_{\rho\sigma} + S^a_{\sigma\rho} + S^a_{\sigma\rho} \right) = 0 \quad - (6) \]
\[ + D_o \left( S^a_{\rho\sigma} + S^a_{\sigma\rho} + S^a_{\sigma\rho} \right) = 0 \quad - (7) \]

Add \( R_{\sigma\rho} \) to both sides of eqn. (6) & sum:

\[ D_o S^a_{\mu\rho} + D_o S^a_{\mu\rho} + D_o S^a_{\rho\sigma} \]

To obtain:

\[ 2 \left( D_o S^a_{\mu\rho} + D_o S^a_{\mu\rho} + D_o S^a_{\rho\sigma} \right) \]
\[ + D_o \left( S^a_{\mu\rho} + S^a_{\mu\nu} + S^a_{\nu\rho} \right) \]
\[ + D_o \left( S^a_{\rho\sigma} + S^a_{\sigma\rho} + S^a_{\sigma\rho} \right) \]
\begin{equation}
+ D_n \left( \mathcal{L} a + \mathcal{L} a + \mathcal{L} a \right)
\end{equation}

\begin{equation}
= D_0 a + D_0 a + D_0 a
\end{equation}

Finally use eqns (3) to (5) in eqn. (8) to

\begin{equation}
D_0 a + D_0 a + D_0 a = 0
\end{equation}

Writing out eq. (9) in full:

\begin{equation}
D_0 D_p \mathcal{T} a + D_0 D_p \mathcal{T} a + D_0 D_p \mathcal{T} a
\end{equation}

\begin{equation}
= D_0 \mathcal{R} a + D_0 \mathcal{R} a + D_0 \mathcal{R} a
\end{equation}

Since eq. (11) is an exact identity, eq. (10) is also an exact identity.

In differential form notation, eq. (10) is:

\begin{equation}
\mathcal{D} \mathcal{A} (D_p \mathcal{T} a) = \mathcal{D} \mathcal{A} \mathcal{R} a
\end{equation}

The p index is at some a letter, side of eq. (11), so:
The misnamed and incorrect second bracket identity of QED absolute physics is:

\[ D_\sigma (D^\tau q) = D_\tau R^\sigma - (12) \]

Eq. (13) is true if and only if:

\[ \Gamma^\lambda_{\mu
u} = \Gamma^\lambda_{\nu\mu} \mp \nabla^\lambda \Gamma^\mu_{\nu\sigma} \mp \Gamma^\mu_{\sigma\nu} \mp \nabla^\mu \Gamma^\sigma_{\nu\lambda} \]

The correct eqn. (13) is:

\[ D_\sigma D_\mu T^{\kappa}_{\nu\lambda} + D_\sigma D_\mu T^{\kappa}_{\nu\sigma} + D_\sigma D_\mu T^{\kappa}_{\sigma\nu} = 0 \]

The correct covariance symmetry is:

\[ \Gamma^\lambda_{\mu
u} = - \Gamma^\lambda_{\nu\mu} \]

Eq. (15) is the identity that should have been used in the Einstein field equation.
Also, Einstein used the isolated convection (14).

By using the second Bianchi identity, eq. (13) in isolated or over contaminated and meaningless procedure. The method he used was to write eq. (13) as:

\[ \dot{D} \mu \nu = 0 \quad (17) \]

where

\[ \mu \nu = \frac{R_{\mu \nu}}{2} R - \mu \nu R \quad (18) \]

Here

\[ R_{\mu \nu} = R_{\mu}^{\lambda} \rho_{\nu} - R_{\mu \nu} \]

is the Ricci tensor and

\[ R = g_{\mu \nu} R_{\mu \nu} \quad (19) \]

The quantity \( \langle \mu \nu \rangle \) is known as the Einstein tensor. The quantity \( R_{\mu \nu} \) is known as the Riemann tensor. The quantities \( R_{\mu \nu} \) and \( R_{\mu \nu} \) are incorrect because eqs. (13) and (14) are incorrect.

Eq. (17) is obtained from eq. (13). The following steps: First lower indices, e.g.:

\[ R_{\mu \nu \rho \sigma} = g_{\mu \lambda} R_{\lambda \nu \rho \sigma} \quad (21) \]

also

\[ g_{\mu \nu} = g_{\lambda \kappa} \quad (22) \]

Secondly we note compatibility, e.g.
\[ \text{To find:} \]
\[ \partial_{\mu} R_{\nu \lambda \rho} + \partial_{\nu} R_{\lambda \mu \rho} + \partial_{\lambda} R_{\mu \nu \rho} = 0 \quad (24) \]

Thirdly use:
\[ g^\mu_{\quad \nu} (\partial_{\nu} R_{\rho \lambda \sigma} + \partial_{\lambda} R_{\rho \nu \sigma} + \partial_{\sigma} R_{\rho \nu \lambda}) \]
\[ = \partial_{\nu} R_{\rho \lambda \sigma} + \partial_{\lambda} R_{\rho \nu \sigma} + \partial_{\sigma} R_{\rho \nu \lambda} \]
\[ = \partial_{\nu} R_{\rho \lambda \sigma} - \partial_{\rho} R_{\nu \lambda \sigma} + \partial_{\sigma} R_{\nu \rho \lambda} \]
\[ = 0 \quad (25) \]
\[ \therefore \quad \partial_{\nu} R_{\rho \lambda \sigma} = \frac{1}{2} \partial_{\sigma} R_{\rho \lambda \nu} \quad (26) \]

Finally we use eq. (26) we:
\[ \partial_{\nu} R_{\rho \lambda \sigma} \partial_{\mu} R_{\sigma \nu \lambda} = 0 \quad (27) \]

\[ \partial_{\nu} (R_{\rho \lambda \sigma} - \frac{1}{2} R g_{\rho \lambda \sigma}) = 0 \quad (28) \]

Q.E.D.

In eq. (25) the following definitions are used:
\[ D^\mu R_{\mu
u} = g^{\rho \sigma} g_{\mu \lambda} D_{\nu} R_{\rho \lambda \nu} \] - (29)
\[ D^{\rho} R_{\rho \mu} = g^{\sigma \lambda} g_{\mu \nu} D_{\sigma} R_{\lambda \nu} \] - (30)
\[ p_{\rho} = g^{\lambda \mu} D_{\lambda } R_{\rho \mu} \] - (31)
\[ \rho_{\mu} = -g^{\lambda \mu} D_{\rho} R_{\lambda \nu} \] - (32)

As S. P. Carroll states on p. 81 (Chapter 3) of his downloadable notes, these definitions of \( A_{\mu} \) and \( B_{\mu} \) are unique if and only if Eq. (44) is used.

**Conclusion**

The Einstein field equations is meaningless geometrically.

**ECE Cosmology**

This is much simpler and nonmathematically correct. It is saved as the Cartan identity:

\[ DN^a = R^{ab} \] - (33)

and the Cartan even identity:

\[ DN^a = R^{ab} \wedge \sqrt{g} \] - (34)
Another fundamental idea of Jacob's physics is the Jacobi identity for Lie brackets. The Jacobi identity is

\[ [[A, B], C] + [[C, A], B] + [[B, C], A] = 0 \]  

where \( [A, B] = -[B, A] = AB - BA \).  

Eq. (1) is true and is easily proven as follows:

\[
[(AB-BA), C] + [(CA-AC), B] + [(BC-CB), A]
\]

\[
= (AB-BA)C - C(AB-BA) + (CA-AC)B - B(CA-AC) + (BC-CB)A - A(BC-CB)
\]

\[
= 0
\]

Q.E.D.

Therefore, the identity for covariant derivatives gives the Jacobi identity:

\[
([D_p, [D_m, D_n]] + D_p, [D_m, D_n]) + [D_m, [D_n, p]] V^n
\]

\[
= 0
\]  

It is incorrectly claimed that Eq. (4) gives the Jacobi identity.
Working out eq. (4) gives:
\[ \rho (R_{\mu \nu} \partial_{\nu} \phi - T_{\mu} \partial_{\nu} \phi) - [D_{\mu}, D_{\nu}] \partial_{\rho} \phi = 0 \] - (5)

Now use:
\[ [D_{\mu}, D_{\rho}] \partial_{\nu} \phi = \partial_{\nu} \left( D_{\mu} \partial_{\rho} \phi - D_{\rho} \partial_{\mu} \phi \right) \]

This is the rule for finding the commutator of covariant derivatives of an arbitrary tensor \( \phi \) of any rank. In eqs. (5) to (7) the quantities \( D_{\nu} \phi \) and \( D_{\nu} \phi \) are evaluated by the commutators of \( D_{\mu} \phi \) and \( D_{\rho} \phi \), which are second rank tensors. Thus:

\[ [D_{\mu}, D_{\nu}] \partial_{\rho} \phi = R_{\mu \nu}^{\rho} \partial_{\rho} \phi - \partial_{\rho} \left( R_{\mu \nu}^{\rho} \partial_{\rho} \phi \right) \] - (9)

\[ [D_{\mu}, D_{\nu}] \partial_{\rho} \phi = R_{\mu \nu}^{\rho} \partial_{\rho} \phi - \partial_{\rho} \left( R_{\mu \nu}^{\rho} \partial_{\rho} \phi \right) \] - (10)

\[ [D_{\mu}, D_{\nu}] \partial_{\rho} \phi = R_{\mu \nu}^{\rho} \partial_{\rho} \phi - \partial_{\rho} \left( R_{\mu \nu}^{\rho} \partial_{\rho} \phi \right) \] - (11)
3) So eq. (4) is:

\[
(D_\mu R^\mu _{\nu \rho} + D_\nu R^\nu _{\mu \rho} + D_\rho R^\rho _{\mu \nu}) V^\lambda
\]

\[
+ (T^\mu - T^\mu _{\rho}) D_\lambda V^\sigma
\]

\[
- (R^\mu _{\lambda \rho} D_\lambda V^\sigma + R^\sigma _{\lambda \mu} D_\lambda V^\nu + R^\rho _{\lambda \mu} D_\lambda V^\nu)
\]

\[= 0 \quad (12)\]

where we have used the contracted identities:

\[
(D_\mu + D_\nu) T^\lambda + D_\rho T^\lambda = -R^\mu _{\rho \lambda} + R^\sigma _{\rho \mu} + R^\rho _{\mu \lambda}
\]

\[= (13)\]

It is seen that eq. (12) does not give the invarient "second Bianchi identity":

\[
(D_\mu R^\mu _{\nu \rho} + D_\nu R^\nu _{\mu \rho} + D_\rho R^\rho _{\mu \nu}) = 0
\]

\[= (14),\]

Q.E.D.
The second "branch identity" is:

\[ \partial \mu \rho + \partial \nu \lambda + \partial \rho \lambda + \partial \nu \rho = 0 \quad - (1) \]

This is the correct basis of the second Einstein field equation. The procedure adopted to contract eq. (1) as follows:

\[ g^{\mu \nu} (\partial \mu \rho_{\lambda} + \partial \nu \lambda + \partial \rho \lambda + \partial \nu \rho) = 0 \quad - (2) \]

By metric compatibility:

\[ \partial_{\mu} (g^{\lambda \rho}_{\lambda} \partial_{\nu} \rho_{\mu}) + \partial_{\nu} (g^{\lambda \rho}_{\lambda} \partial_{\mu} \rho_{\nu}) + g^{\lambda \rho}_{\lambda} \partial_{\mu} \partial_{\nu} \rho_{\mu} = 0 \quad - (3) \]

Here, the metric is symmetric:

\[ \Gamma^{\lambda}_{\mu \nu} = \Gamma^{\lambda}_{\nu \mu} \quad - (4) \]

etc. It is directly assumed that the connection is also symmetric:

\[ \Gamma^{\lambda}_{\mu \nu} = \Gamma^{\lambda}_{\nu \mu} = 0 \quad - (5) \]

If eq. (5) is assumed:

\[ \rho_{\mu \rho_{\mu}} = 0 \quad - (6) \]

and:

\[ \rho_{\mu \rho} = \rho_{\rho \mu} \quad - (7) \]

Also, it correct symmetries. Re only
content symmetry is:
\[ R_{\mu \nu \lambda \rho} = - R_{\lambda \rho \mu \nu} \quad (8) \]

The incorrect symmetry (7) is used to define the Ricci tensor:
\[ R_{\lambda \rho} \equiv \frac{\partial R_{\lambda \rho \mu \nu}}{\partial x^\mu} - \frac{\partial R_{\lambda \mu \rho \nu}}{\partial x^\nu} \]

By (7) and (9), finally let following contracts is made:
\[ g^{\sigma \lambda} g^{\kappa \mu} R_{\sigma \lambda \kappa \mu} = 0 \]
\[ g^{\sigma \lambda} g^{\kappa \mu} R_{\rho \lambda \kappa \mu} = 0 \]
This contradiction again depends on the use of (5).

This contradiction again depends on the use of (6).

This contradiction again depends on the use of (7).

This contradiction again depends on the use of (8).

So, eq. (3) becomes the incorrect:
\[ D^\nu R_{\nu \mu} - D^\nu R + D^\nu R_{\nu \mu} = 0 \quad (13) \]

with the incorrect:
\[ R_{\mu \nu} = - R_{\nu \mu} \quad (13') \]

Eq. (13) is written as:
\[ D^\mu b_{\mu \nu} = 0 \quad (14) \]
3) in which the Einstein field equation is rewritten
defined: \[ G_{\mu\nu} := R_{\mu\nu} - \frac{1}{2} g \nabla_\mu \nabla_\nu = 0 \] (15)

Einstein fuller computed this error by

claiming that

\[ \nabla_\mu g_{\lambda\nu} = 0 \Rightarrow D_\mu T_{\lambda\nu} = - (16) \]

where

\[ T_{\lambda\nu} = T^{\lambda\nu} \] (17)

is a canonical energy-momentum

tensor. Finally it was claimed that

\[ g_{\lambda\nu} := 2 \kappa \nabla_\lambda \nabla_\nu, \] (18)

a meaningless equation.

The correct field equations are based directly and simply

\[ D_\lambda T^{\lambda\nu} = R^{\lambda\nu} \] (19)

and

\[ D_\lambda T^{\lambda\nu} = R^{\lambda\nu} \] (20)

in which

\[ \Gamma^\lambda_{\mu\nu} = - \Gamma^\lambda_{\nu\mu}. \] (21)
Invariance of a Vector Field under Coordinate Transformation

This is denoted in general as 

\[ V = V' \mathbf{e}^\mu(n) = V' \mathbf{e}^\mu(n') - (1) \]

For example, considering a Lorentz boost is

\[ x \rightarrow x' = \left[ \begin{array}{c} ct \\ x \end{array} \right] - (2) \]

The y and z axes remain the same, so we need only consider (2). The vector field is

\[ V = ct \mathbf{e}_0 + x \mathbf{i} - (3) \]

In vector notation, so:

\[ V = V' = \left( ct \right) \mathbf{e}_0' + x' \mathbf{i}' - (4) \]

The x-axis Lorentz boost is:

\[ \Lambda = \left[ \begin{array}{cc} \cosh \phi & \sinh \phi \\ -\sinh \phi & \cosh \phi \end{array} \right] - (5) \]

The inverse Lorentz boost is \( \Lambda^{-1} \) defined by

\[ \Lambda \Lambda^{-1} = \left[ \begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right] - (6) \]
So:

\[ \Lambda^{-1} = \begin{bmatrix} \cos \phi & \sin \phi \\ -\sin \phi & \cos \phi \end{bmatrix} \]  \hspace{1cm} (7)

The components transform as:

\[ \begin{bmatrix} ct' \\ x' \end{bmatrix} = \begin{bmatrix} \cos \phi & -\sin \phi \\ -\sin \phi & \cos \phi \end{bmatrix} \begin{bmatrix} ct \\ x \end{bmatrix} \]  \hspace{1cm} (8)

i.e.

\[ ct' = ct \cos \phi - x \sin \phi \]  \hspace{1cm} (9)
\[ x' = -ct \sin \phi + x \cos \phi \]  \hspace{1cm} (10)

The unit vectors \( \mathbf{e} (\mu) \) transform as:

\[ \begin{bmatrix} e'_0 \\ e'_i \end{bmatrix} = \begin{bmatrix} \cos \phi & \sin \phi \\ -\sin \phi & \cos \phi \end{bmatrix} \begin{bmatrix} e_0 \\ i \end{bmatrix} \]  \hspace{1cm} (11)

i.e.

\[ e'_0 = e_0 \cos \phi + i \sin \phi \]  \hspace{1cm} (12)
\[ i' = e_0 \sin \phi + i \cos \phi \]  \hspace{1cm} (13)

Both components and unit vectors transform covariantly according to Eqs. (8) and (11).

Check

We have:
\[ V = c t^2 e_0 + x i \quad - (14) \]

\[ V' = c t' e_0' + x' i' \quad - (15) \]

Eq. (15) is:
\[ V' = (c t \cos \phi - x \sin \phi) e_0 + (x \cos \phi + c t \sin \phi) i \]
\[ + (c t \sin \phi - x \cos \phi) e_0 + (x \sin \phi + c t \cos \phi) i \]
\[ = c t (\cos^2 \phi - \sin^2 \phi) e_0 + x (\cos^2 \phi - \sin^2 \phi) i \]
\[ - x \sin \phi \cos \phi e_0 + x \sin \phi \cos \phi e_0 \]
\[ - c t \sin \phi \cos \phi i + c t \sin \phi \cos \phi i \]
\[ = c t e_0 + x i \quad - (16) \]

Q.E.D.

Application to D Cyclic Theorem:
The D Cyclic Theorem is:
\[ B (1) \times B (2) = i B \quad - (17) \]

\[ \text{et cyclicum} \]
\[ i \phi \quad - (18) \]

where
\[ B (1) = B (1) e^{i \phi} \quad - (19) \]
\[ B (2) = B (2) e^{-i \phi} \]
4) \[ B^{(3)*} = B^{(3)} - B^{(0)} e^{(3)} \] - (20)

So eq. (17) is:
\[ e^{(1)} \times e^{(2)} = i e^{(3)*} \] - (21)

The basis vectors \( e^{(1)} \) and \( e^{(2)} \) are Lorentz covariant by definition. So, the \( B \) is Lorentz covariant.

Cyclic Theorem (17) is Lorentz covariant.

Q.E.D.

The complex circular basis vectors are:
\[ e^{(1)} = \frac{1}{\sqrt{2}} \left( 1 - i \right) \]
\[ e^{(2)} = \frac{1}{\sqrt{2}} \left( 1 + i \right) \]
\[ e^{(3)} = k \]

They are complex constitutions of the Cartesian unit vectors.
The fundamental theorem of Riemann geometry is:
\[
\mathbf{E}_{\mu, \nu} \cdot \mathbf{D}_{ab} \mathbf{V}^c = \left( \mathbf{D}_a \mathbf{V}^b - \mathbf{D}_b \mathbf{V}^a - \mathbf{D}_a \mathbf{V}^c \mathbf{g}^b + \mathbf{D}_b \mathbf{V}^c \mathbf{g}^a \right) \mathbf{V}^d - \left( \mathbf{D}_a \mathbf{V}^b \right) \mathbf{D}_b \mathbf{V}^c - \mathbf{D}_a \mathbf{V}^c \mathbf{D}_b \mathbf{V}^d - \mathbf{D}_a \mathbf{V}^d \mathbf{D}_b \mathbf{V}^c.
\]  

Therefore
\[
\Gamma_{\lambda}^{\mu} = \Gamma_{\lambda}^{\mu} = \Gamma_{\lambda}^{\mu} = 0, \quad - (5)
\]

Also,
\[
\begin{align*}
\Gamma_{\lambda}^{\mu} - \Gamma_{\lambda}^{\mu} &= \Gamma_{\lambda}^{\mu} = 0, \\
\Gamma_{\lambda}^{\mu} &= \Gamma_{\lambda}^{\mu} = 0.
\end{align*}
\]  

The only non-zero connections are:
\[
\begin{align*}
\Gamma_{\lambda}^{\mu} &= \Gamma_{10}^{\lambda}, \\
\Gamma_{\lambda}^{\mu} &= \Gamma_{21}^{\lambda}.
\end{align*}
\]

Therefore is the Riemann tensor:
\[
\mathbf{R}^{\lambda}_{\mu \nu} = \mathbf{D}_a \mathbf{V}^{\lambda} - \mathbf{D}_\lambda \mathbf{V}^a + \mathbf{D}_\lambda \mathbf{V}^b \mathbf{g}^a - \mathbf{D}_a \mathbf{V}^c \mathbf{g}^\lambda.
\]  

And
\[
\mathbf{R}^{\lambda}_{\mu \nu} = - \mathbf{R}^{\lambda}_{\nu \mu}. \quad - (10)
\]
The other symmetries are:

\[ T_{\mu\nu} = - T_{\nu\mu}, \quad \] (11)
\[ \Gamma_{\mu\nu}^{\lambda} = - \Gamma_{\nu\mu}^{\lambda}, \quad \] (12)
\[ \Gamma_{\mu\nu}^{\lambda} = - \Gamma_{\lambda\mu}^{\nu}, \quad \] (13)
\[ \partial_{\mu} \Gamma_{\nu\sigma}^{\lambda} = \partial_{\nu} \Gamma_{\mu\sigma}^{\lambda} = 0, \quad \] (14)
\[ \partial_{\mu} \Gamma_{\nu\sigma}^{\lambda} = \partial_{\nu} \Gamma_{\mu\sigma}^{\lambda} = 0, \quad \] (15)
\[ \Gamma_{\mu\nu}^{\lambda} = - \Gamma_{\nu\mu}^{\lambda}, \quad \] (16)
\[ \Gamma_{\mu\nu}^{\lambda} = - \Gamma_{\nu\mu}^{\lambda}, \quad \] (17)
\[ \Gamma_{\mu\nu}^{\lambda} = - \Gamma_{\nu\mu}^{\lambda}, \quad \] (18)
\[ \Gamma_{\mu\nu}^{\lambda} = - \Gamma_{\nu\mu}^{\lambda}, \quad \] (19)
\[ \Gamma_{\mu\nu}^{\lambda} = - \Gamma_{\nu\mu}^{\lambda}, \quad \] (20)

The error is in the Twenty-First Century Cosmology text that the connection could be.

This was to assume that the connection could be symmetric and non-zero. This is a glaring error because it assumes that there is a non-zero symmetric commutator. This assumption was used to write the incorrect equation:

\[ [\partial_{\mu}, \partial_{\nu}] V^\rho = \partial_{\mu} (\partial_{\nu} V^\rho - \partial_{\nu} V^\rho + \partial_{\nu} \Gamma_{\mu\nu}^{\lambda} \to 0 \] (21)

In this equation there is no indication of the symmetry of the connection, whereas it corrects the symmetry (12) through:

(1) fixes the anti-symmetry (12) through:
\[ [D_m, D_n] \nabla^\nu = -\Gamma^\lambda_{\mu \nu} + \ldots \ldots - (22) \]

The commutator \([D_m, D_n]\) and the connection \(\Gamma^\lambda_{\mu \nu}\) must both be antisymmetric.

In the correct eqn. (21), there is nothing to indicate this, and the error was compounded by assuming that:

\[ \Gamma^\lambda_{\mu \nu} = \frac{1}{2} (\Gamma^\lambda_{\mu \nu} + \Gamma^\lambda_{\nu \mu}) + \frac{1}{2} (\Gamma^\lambda_{\mu \nu} - \Gamma^\lambda_{\nu \mu}) \]

in which:

\[ \Gamma^\lambda_{\mu \nu} (S) = 2 \Gamma^\lambda_{\mu \nu} (S) - (23) \]

and

\[ \Gamma^\lambda_{\mu \nu} (A) = -\Gamma^\lambda_{\nu \mu} (A) \]

The correct eqn. (22) shows that eqn. (25) is correct antisymmetric.

The basic error is so glaring:

\[ [D_m, D_n] \nabla^\nu = ? [D_m, D_n] \nabla^\nu + ? \cdot 0 \]

that some reason is read into why it was made, and why it was repeated for sixty years.
The theory of parallel transport depends on the connection and different connections will give different answers. The parallel transport equation is

\[ \frac{dV^\mu}{d\lambda} + \Gamma^\mu_{\rho\sigma} V^\rho \xi^\sigma = 0 \]

where the connection appears as \( \Gamma^\mu_{\rho\sigma} \). Solving this, for a vector \( V^\mu \) amounts to finding a matrix \( p^\mu_\rho (\lambda, \lambda_0) \) which relates the vector at its initial value \( V^\mu (\lambda_0) \) to its value later in the path:

\[ V^\mu (\lambda) = p^\mu_\rho (\lambda, \lambda_0) V^\rho (\lambda_0) \]

Define the matrix:

\[ A^\mu_\rho (\lambda) = -\Gamma^\mu_{\rho\sigma} \frac{d\xi^\sigma}{d\lambda} \]

Then:

\[ \frac{dp^\mu_\rho (\lambda, \lambda_0)}{d\lambda} = A^\mu_\rho (\lambda) p^\rho_\nu (\lambda, \lambda_0) \]

Schrödinger's equation for a time ordered operator has the same form as eq. (5). Its solution can be expressed as a path ordered exponential similar to Dyson's solution:

\[ p^\mu_\rho (\lambda, \lambda_0) = \hat{\exp} \left( -\int_{\lambda_0}^{\lambda} \Gamma^\mu_{\rho\sigma} d\xi^\sigma d\lambda \right) \]

If the path is a loop, starting and ending at the same point, then \( p^\mu_\rho (\lambda, \lambda_0) \) is a Lorentz transformation.
on the tangent space at the point. The transformation is known as the holonomy of the loop. Knowing the holonomy of every possible loop is equivalent to knowing the metric.

If the connection is not symmetric, all of geodesic theory is changed.

The tangent vector to a path \( x^\mu(t) \) is \( \frac{dx^\mu}{dt} \). Parallel transport of the tangent vector is

\[
\frac{D}{dt} \left( \frac{dx^\mu}{dt} \right) = 0 \quad - (6)
\]

i.e.

\[
\frac{d^2 x^\mu}{dt^2} + \Gamma^\mu_{\rho \sigma} \frac{dx^\rho}{dt} \frac{dx^\sigma}{dt} = 0 \quad - (7)
\]

The proper time is calculated using the definition of a time-like path (Carroll notes, eq. (3.48)):

\[
\tau = \int \left( -g_{\mu \nu} \frac{dx^\mu}{dt} \frac{dx^\nu}{dt} \right)^{1/2} dt \quad - (8)
\]

The calculus of variation gives the equations:

\[
\frac{d^2 x^\mu}{dt^2} + \frac{1}{2} g^{\rho \sigma} \left( \frac{dx^\rho}{dt} \frac{dx_\sigma}{dt} + \frac{dx_\sigma}{dt} \frac{dx^\rho}{dt} - \frac{dx^\rho}{dt} \frac{dx^\sigma}{dt} \right) \frac{dx^\mu}{dt} \frac{dx^\nu}{dt} = 0 \quad - (9)
\]

Eq. (9) reduces to eqn. (1) if and only
In other words, if

\[ \alpha = \frac{1}{2} g \cdot (d g \cdot + d g \cdot) - g \cdot g \]  

(10)

In general, eq. (10) is not true, and if general, eqs. (1) and (9) are not the same.

Eq. (6) is the path of the parallel transport of the tangent vector. Eq. (7) is the distance between two points. When the cosmology does not lead to the same result, these concepts do not lead to the same result.

Einstein used eq. (7) to derive the Newtonian limit (Cammell eq. (4.7) ff).

So Einstein's theory depends on the assumption of a symmetric cosmology. It is now known that the cosmology is antisymmetric, and can never be symmetric. Einstein's method was to consider the Newtonian limit as:

\[ \frac{d x}{d t} \ll \frac{d t}{d t} \]  

(11)

so eq. (7) reduces to:
\[
\frac{d^2 x^\mu}{d\tau^2} + \Gamma^\mu_{\nu\lambda} \left( \frac{dt}{d\tau} \right)^2 = 0. \quad (12)
\]

Existence again assume \( \Gamma \) covariant symmetric
consider:
\[
\Gamma^\mu_{00} = \frac{1}{2} g^{\mu \lambda} \left( \partial_0 g_{\lambda 0} + \partial_0 g_{0\lambda} - 2 \partial_0 g_{00} \right)
\]
\[
= -\frac{1}{2} g^{\mu \lambda} \partial_\lambda g_{00} \quad (13)
\]

and at this point it may be concluded that
Existence procedure is meaningless.
For the sake of completeness it is described as follows. The metric is expanded as a perturbation
of the Minkowski metric \( \eta^\mu_\nu \):
\[
g_{\mu\nu} = \eta_\mu_\nu + h_{\mu\nu} \quad |h_{\mu\nu}| << 1 \quad (14)
\]

Then we:
\[
g_{\mu0} g_{0\nu} = \eta_{\mu\nu} \quad (15)
\]

so:
\[
g_{\mu0} = \eta_{\mu0} - h_{\mu0} \quad (16)
\]

Thus:
\[
\Gamma^\mu_{00} = -\frac{1}{2} \eta^\nu_{\mu\lambda} \partial_\lambda h_{00} \quad (17)
\]

From eq. (17) and eq. (12):
\[
\frac{d^2 x^\mu}{d\tau^2} = \frac{1}{2} \eta^\nu_{\mu\lambda} \partial_\lambda h_{00} \left( \frac{dt}{d\tau} \right)^2 \quad (18)
\]
The space-like components are given by:

\[ \frac{d^2 x}{d t^2} = \frac{1}{2} \left( \frac{d t}{d \tau} \right)^2 \left( \frac{d \tau}{d t} \right)^2 \]  

or

\[ \frac{d^2 x}{d t^2} = \frac{1}{2} \left( \frac{d \tau}{d t} \right)^2 \]  

Finally, the corrected eq. (22) is claimed to be the Newtonian theory claimed to be the Newtonian theory by W. L[ett] claimed to be the Newtonian theory. 

The arbitrary assertion:

\[ h_{00} = -2 \frac{\Phi}{c^2} \]  

where

\[ \Phi = -8 \pi G M \]  

It is claimed correctly that eq. (24) was derived by Schwarzschild in 1916 for a metric solution of the Einstein field equation.
Eq. (10) is derived from the correct equation

\[ \Gamma_{\mu
u} = \rho \cdot \chi \]  

(25)

and the assumption of metric compatibility ([16]).

Eq. (3.17)

\[ \rho \partial_{\mu} g_{\nu\lambda} = 0 \]  

(26)

For eq. (26):

\[ \frac{\partial g_{\mu\nu}}{\partial x^\alpha} + \Gamma_{\mu\alpha
\rho} g_{\nu\lambda} - \Gamma_{\nu\alpha\rho} g_{\mu\lambda} = 0 \]  

(27)

Substituting eqs. (28) and (29) for eq. (27):

\[ \frac{\partial g_{\mu\nu}}{\partial x^\alpha} + \Gamma_{\mu\alpha\rho} g_{\nu\lambda} - \Gamma_{\nu\alpha\rho} g_{\mu\lambda} = 0 \]  

(30)

It is now assumed correctly

\[ \Gamma_{\mu
\nu} = \rho \cdot \chi \]  

(31)

\[ \Gamma_{\rho\mu
\nu} = \rho \cdot \chi \]  

(32)
The metric is symmetric, so it is assumed that
\[ \Gamma_{\mu\nu}^{\lambda} = \frac{1}{2} g_{\mu\lambda} \left( \partial_{\nu} g_{\lambda\rho} + \partial_{\rho} g_{\lambda\nu} - \partial_{\nu} g_{\rho\lambda} \right) \] - (37)

Eq. (30) becomes:
\[ \partial_{\nu} g_{\mu\rho} - \partial_{\rho} g_{\mu\nu} = 2 \partial_{\nu} \Gamma_{\mu\rho}^{\lambda} \] - (35)

Now it is correctly assumed that
\[ \Gamma_{\mu\nu}^{\lambda} = \frac{1}{2} g_{\mu\lambda} \left( \partial_{\nu} g_{\lambda\rho} + \partial_{\rho} g_{\lambda\nu} - \partial_{\nu} g_{\rho\lambda} \right) \] - (36)

So:

This incorrect formula is found in all textbooks of general relativity.

ECE theory does not use eqn. (37).

\[ \text{(37)} \]