

186(6): Correct Use of the New Formula

The new formula is:

$$\Gamma_{\rho\mu}^{\sigma} = \frac{1}{4} g^{\sigma d} g_{\rho} g_{\mu d} \quad - (1)$$

in which:

$$\sigma = d = \mu \quad - (2)$$

and

$$\rho \neq \mu. \quad - (3)$$

So for example:

$$\Gamma_{10}^0 = \frac{1}{4} g^{00} g_1 g_{00} \quad - (4)$$

in which:

$$\sigma = d = \mu = 0 \quad - (5)$$

and :

$$\rho = 1, \mu = 0 \quad - (6)$$

This is a correct use of the formula.

However, in Γ_{01}^0 , we have:

$$\sigma = 0, \rho = 0, \mu = 1 \quad - (7)$$

and $\sigma \neq \mu$. So Γ_{01}^0 cannot be evaluated with the formula. It is known from the commutator method that:

$$\Gamma_{10}^0 = -\Gamma_{01}^0 \quad - (8)$$