

4) Note 188(4) : No Varying Antisymmetric  
Connections from a Diagonal Metric

The starting equation is:

$$\partial_\nu g_{\mu\lambda} = 2 \Gamma_{\nu\mu}^\lambda g_{\mu\lambda} \quad - (1)$$

$$\mu \neq \nu \quad - (2)$$

$$\nu = 0, 1, 2, 3 \quad - (3)$$

$$\mu = 0, 1, 2, 3 \quad - (4)$$

Therefore:

1)  $\partial_\nu g_{00} = 2 \Gamma_{\nu 0}^0 g_{00} \quad - (5)$

$$\nu = 1, \quad \partial_1 g_{00} = 2 \Gamma_{10}^0 g_{00} \quad - (6)$$

$$\nu = 2, \quad \partial_2 g_{00} = 2 \Gamma_{20}^0 g_{00} \quad - (7)$$

$$\nu = 3, \quad \partial_3 g_{00} = 2 \Gamma_{30}^0 g_{00} \quad - (8)$$

2)  $\partial_\nu g_{11} = 2 \Gamma_{\nu 1}^1 g_{11} \quad - (9)$

$$\nu = 0 \quad \partial_0 g_{11} = 2 \Gamma_{01}^1 g_{11} \quad - (10)$$

$$\nu = 2 \quad \partial_2 g_{11} = 2 \Gamma_{21}^1 g_{11} \quad - (11)$$

$$\nu = 3 \quad \partial_3 g_{11} = 2 \Gamma_{31}^1 g_{11} \quad - (12)$$

3)  $\partial_\nu g_{22} = 2 \Gamma_{\nu 2}^2 g_{22} \quad - (13)$

$$\nu = 0 \quad \partial_0 g_{22} = 2 \Gamma_{02}^2 g_{22} \quad - (14)$$

$$\nu = 1 \quad \partial_1 g_{22} = 2 \Gamma_{12}^2 g_{22} \quad - (15)$$

$$\nu = 3 \quad \partial_3 g_{22} = 2 \Gamma_{32}^2 g_{22} \quad - (16)$$

4)  $\partial_\nu g_{33} = 2 \Gamma_{\nu 3}^3 g_{33} \quad - (17)$

$$\sim = 0 \quad \partial_0 g_{33} = 2 \Gamma^3_{03} g_{33} \quad - (18)$$

$$\sim = 1 \quad \partial_1 g_{33} = 2 \Gamma^3_{13} g_{33} \quad - (19)$$

$$\sim = 2 \quad \partial_2 g_{33} = 2 \Gamma^3_{23} g_{33} \quad - (20)$$

### SUMMARY TABLE

$\mu$	$\sim$	$\Gamma^\lambda_{\mu\sim} = - \Gamma^\lambda_{\sim\mu}$
0	1	$\Gamma^0_{10}$
	2	$\Gamma^0_{20}$
	3	$\Gamma^0_{30}$
1	0	$\Gamma^1_{01}$
	2	$\Gamma^1_{21}$
	3	$\Gamma^1_{31}$
2	0	$\Gamma^2_{02}$
	1	$\Gamma^2_{12}$
	3	$\Gamma^2_{32}$
3	0	$\Gamma^3_{03}$
	1	$\Gamma^3_{13}$
	2	$\Gamma^3_{23}$