1)

91(2) Equations of Torsion based cosmology in the Einstein Hilbert Limit

In note 91(1) the S torsion was defined in terms of the Riemann form and Riemann tensor. The tensorial definition of the S tensor is:

$$R^{\kappa}{}_{\mu\nu\rho} := D_{\mu} S^{\kappa}{}_{\nu\rho} \qquad -(1)$$

In indexless notation this equation is:

$$\boxed{R := DS} \qquad -(2)$$

In paper 88 it was shown that there is only one Bianchi identity:

$$D \wedge T := R \wedge V \qquad -(3)$$

where T is the Cartan torsion form, denoted T. Note carefully that there is a difference between the T and S torsions. The Riemann form R may be non-zero when T is zero, but if R is non-zero, S is also non-zero from eq. (2).

The Einstein Hilbert limit of eq. (3) is:

$$T = 0, \quad R \neq 0. \qquad -(4)$$

In this limit:

2)

$$R \wedge \eta = 0 \quad -(5)$$

$$D \wedge R = 0 \quad -(6)$$

and the EH field equation is:

$$D \wedge R = \kappa D \wedge N. \quad -(7)$$

This is traditionally expressed as:

$$DG_s = \kappa D N_s. \quad -(8)$$

where G_s is the Einstein tensor and N_s the symmetric Noether tensor. Eqns. (7) and (8) are equivalent. The solution chosen by Einstein was:

$$G_s = \kappa N_s \quad -(9)$$

which is the traditional field equation of general relativity and cosmology.

From eq. (2) and eq. (7):

$$\boxed{D \wedge (DS) = \kappa D \wedge N} \quad -(10)$$

which is a general relativity and cosmology based on torsion. The $S^{\mu}{}_{\rho\nu}$ torsion tensor S^{μ} has only three indices, so is simpler than the Riemann curvature tensor $R^{\mu}{}_{\rho\nu\sigma}$, which has four indices, so the mathematics of this cosmology are also simpler.

3)

The first step is to re-express eq. (10) in the traditional format (8) but leads to the field equation of Einstein, eq. (9). Then this equation must be solved without using any of the basic ideas of the standard model. These ideas lead to false physics such as big bang, black holes, and dark matter. Sooner or later the subject of physics will have to admit the error pointed out by Crothers. These must not be repeated in solving eq. (10).