74(5): Spin Connection Resonance and Magnetic Motors.

When the magnetic motor is static there is a spacetime balance described by:

$$\underline{\nabla} \times \underline{A}^{(2)} = i g \, \underline{A}^{(2)} \times \underline{A}^{(3)} \quad -(1)$$

$$= -\kappa_1 \, \underline{A}^{(2)}$$

where:

$$\underline{A}^{(2)} = \frac{A^{(0)}}{\sqrt{2}} \left(\underline{i} + i \underline{j} \right) e^{-i\phi}, \quad -(2)$$

$$\underline{A}^{(3)} = A^{(0)} \underline{k} . \quad -(3)$$

Here $A^{(0)}$ is produced by the magnetic field of the motor. The balance condition is therefore:

$$\nabla^2 \underline{A}^{(2)} + \kappa_1^2 \underline{A}^{(2)} = \underline{0} \quad -(4)$$

which is a Helmholtz wave equation.

Similarly:

$$\nabla^2 \underline{A}^{(1)} + \kappa_1^2 \underline{A}^{(1)} = \underline{0} \quad -(5)$$

and

$$\nabla^2 \underline{A}^{(3)} + \kappa_2^2 \underline{A}^{(3)} = \underline{0} \quad -(6)$$

where

$$\kappa_2 = 0 \quad -(7)$$

2)

The balance is broken when the right hand sides of eqns. (4) to (6) are finite. If it is assumed that eq. (6), for example, becomes:

$$\frac{\partial^2 A_Z}{\partial Z^2} + \kappa_2^2 A_Z = \mu_0 J_0 \cos(\kappa Z) \quad \text{— (8)}$$

then:

$$A_Z = \frac{\mu_0 J_0 \cos(\kappa Z)}{\kappa^2 - \kappa_2^2} \quad \text{— (9)}$$

and when:

$$\kappa = \kappa_2 \quad \text{— (10)}$$

then

$$A_Z \longrightarrow \infty . \quad \text{— (11)}$$

The torque produced in the magnetic assembly is:

$$\boxed{\underline{Tq} = - A_Z \, \underline{m} \times \underline{k}} \quad \text{— (12)}$$

and becomes <u>very large</u>. The property $J_0 \cos(\kappa Z)$ is a _________ property of the magnetic assembly and $\kappa_2 = 1/r_2$ is a <u>spin connection</u> of spacetime. Under the resonance condition (10) the magnet spins