359(4): Calculation of Charges and Vorticity

Consider the velocity fields:

$$\underline{v}_{F1} = \frac{(mG)^{1/2}}{(X^2+Y^2)^{3/2}}\left(-Y\underline{i}+X\underline{j}\right) \quad -(1)$$

$$\underline{v}_{F2} = \frac{(mG)^{1/2}}{(X^2+Z^2)^{3/2}}\left(-Z\underline{i}+X\underline{k}\right) \quad -(2)$$

$$\underline{v}_{F3} = \frac{(mG)^{1/2}}{(Y^2+Z^2)^{3/2}}\left(-Z\underline{j}+Y\underline{k}\right) \quad -(3)$$

These produce the three Kambe charges or frequencies:

$$q_{F1} = \underline{\nabla}\cdot\underline{g}_{F1} = \frac{mG}{(X^2+Y^2)^{3/2}} \quad -(4)$$

$$q_{F2} = \underline{\nabla}\cdot\underline{g}_{F2} = \frac{mG}{(X^2+Z^2)^{3/2}} \quad -(5)$$

$$q_{F3} = \underline{\nabla}\cdot\underline{g}_{F3} = \frac{mG}{(Y^2+Z^2)^{3/2}} \quad -(6)$$

where

$$\underline{g}_i = \left(\underline{v}_{Fi}\cdot\underline{\nabla}\right)\underline{v}_{Fi} \quad -(6a)$$

$$i = 1, 2, 3$$

These spacetime or vacuum frequencies are generated by a Newtonian or Coulombic field and are related to mass density.

The three velocity fields (1) to (3) also

) generate the three spacetime vorticities or Kambe magnetic fields:

$$\underline{W}_{F1} = \underline{\nabla} \times \underline{V}_{F1} = \frac{3(X+Y)}{(X^2+Y^2)^{5/2}} \underline{k} \quad -(7)$$

$$\underline{W}_{F2} = \underline{\nabla} \times \underline{V}_{F2} = \frac{3(X+Z)}{(X^2+Y^2)^{5/2}} \underline{j} \quad -(8)$$

$$\underline{W}_{F3} = \underline{\nabla} \times \underline{V}_{F3} = \frac{3(Y+Z)}{(Y^2+Z^2)^{5/2}} \underline{i} \quad -(9)$$

These spacetime or vacuum or aether vortices are generated by a Newtonian or Coulombic field.

These properties of the vacuum can be graphed in Cartesian or spherical polar coordinates. These graphs would show a richly structured vacuum or aether or spacetime. The Newtonian acceleration itself is defined as in Note 359(3). The gravitomagnetic fields have the property

$$\underline{\nabla} \cdot \underline{W}_{F1} = \underline{\nabla} \cdot \underline{W}_{F2} = \underline{\nabla} \cdot \underline{W}_{F3} = 0 \quad -(10)$$

as can be verified from eqs. (7) to (9) using:

3)
$$\underline{\nabla} = \underline{i}\frac{\partial}{\partial X} + \underline{j}\frac{\partial}{\partial Y} + \underline{k}\frac{\partial}{\partial Z} \quad -(11)$$

It follows that
$$\underline{\nabla} \cdot \underline{W}_F = 0 \quad -(12)$$

where
$$\underline{W}_F = \underline{W}_{F1} + \underline{W}_{F2} + \underline{W}_{F3} \quad -(13)$$

is the total vorticity of the vacuum. The total vorticity can be graphed in Cartesian and spherical polar coordinates.