Notes 58(1): Summary of the ECE Theory of the ESA Experiment

Spinning the superconductor produces:

$$F^a = A^{(0)} T^a = A^{(0)} \left(d \wedge q^a + \omega^a{}_b \wedge q^b \right)$$

$$= d \wedge A^a + \omega^a{}_b \wedge A^b \quad -(1)$$

and the potential A^a produces the London current:

$$L j^a = - k^2 A^a \quad -(2)$$

The spinning superconductor also produces the spacetime current j^a defined by:

$$d \wedge F^a = \mu_0 j^a \quad -(3)$$

$$d \wedge \tilde{F}^a = \mu_0 J^a \quad -(4) \qquad -(5)$$

Here:

$$j^a = \frac{A^{(0)}}{\mu_0} \left(R^a{}_b \wedge q^b - \omega^a{}_b \wedge T^b \right)$$

$$J^a = \frac{A^{(0)}}{\mu_0} \left(\tilde{R}^a{}_b \wedge q^b - \omega^a{}_b \wedge \tilde{T}^b \right). \quad -(6)$$

Therefore the London current $L j^a$ produces charges in $R^a{}_b$ and T^b, i.e. the charge. The accelerometers pick up the charge. The potential A^a obeys:

$$\Box A^a = - k^2 A^a \quad -(7)$$

and:

$$d \wedge \left(d \wedge A^a + \omega^a{}_b \wedge A^b \right) = \mu_0 j^a \quad -(8)$$