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Signature of a New Boson

In 2013 B G Sidharth published a paper in Hadronic Journal (December Issue) in which he investigated what happens to the electromagnetic field using a noncommutative spacetime with a few minor refinements. The paper is appearing in the Italian Journal of Pure & Applied Mathematics. Here we have

$$-\frac{\partial B_z}{\partial x} = 4\pi j_y + \epsilon \frac{\partial E_y}{\partial t} \tag{1}$$

$$\frac{\partial B_z}{\partial y} = 4\pi j_x + \epsilon \frac{\partial E_x}{\partial t} \tag{2}$$

$$\frac{\partial E_y}{\partial t} = 4\pi j_y - \epsilon \frac{\partial B_z}{\partial x} \tag{3}$$

$$\frac{\partial E_x}{\partial t} = 4\pi j_x + \epsilon \frac{\partial B_z}{\partial y} \tag{4}$$

$$-\frac{\partial E_y}{\partial y} = 4\pi \frac{\partial \rho}{\partial t} - \epsilon \frac{\partial E_x}{\partial x} \tag{5}$$

$$-\frac{\partial E_x}{\partial x} = 4\pi \frac{\partial \rho}{\partial t} - \epsilon \frac{\partial E_y}{\partial y} \tag{6}$$

If ϵ is +1 we have the noncommutative electromagnetism, if ϵ is 0 we have our usual electromagnetism and if ϵ is -1 we have a reversed electromagnetism.

A detailed examination of this shows that it carries the signature of a spin 1 photon or particle given by

1

0

–1

which when appended to the electromagnetic field gives all these cases.