Errata à l'article

Electroweak gauge fields, particles, and antiparticles arise from probability

G. Quznetsov

(AFLB, Volume 29, hors série no 2, 2004 p. 927)

page 930: line 14 replace by the following text:

with $\mathbf{P}$ as a probability function. $\rho_\wp$ is not invariant for the Lorentz transformation. Let $\langle \rho_\wp, \mathbf{j}_\wp \rangle$ be a probability current 3+1-vector.

page 930: line 15 replace by the following text:

Let $k \in \{1,2,3,4\}$, $s \in \{1,2,3,4\}$, $\alpha \in \{1,2,3\}$ and $\varphi_k(t,\mathbf{x})$ be some complex solution of the following set of equations:

page 930: equation (4) replace by the following set of equations:

$$\left\{ \begin{array}{c} \sum_{k=1}^{4} \varphi_k^*(t,\mathbf{x}) \varphi_k(t,\mathbf{x}) = \rho_{\wp,\alpha}(t,\mathbf{x}), \\ \sum_{k=1}^{4} \sum_{s=1}^{4} \varphi_k^*(t,\mathbf{x}) \beta_{k,s}^{[\alpha]} \varphi_s(t,\mathbf{x}) = -j_{\wp,\alpha}(t,\mathbf{x}). \end{array} \right|$$

Between this equations and line 18 put in the following text:

If a 3-vector $\mathbf{u}_\wp$ is denoted as

$$\mathbf{j}_\wp \stackrel{def}{=} \rho_\wp \mathbf{u}_\wp$$

then $\mathbf{u}_\wp$ is called as *a local velocity of the probability propagation.*

All text on page 931 and lines 1-16 of page 932 replace by the following text:

Let $j \in \{1,2,3,4\}$, $k \in \{1,2,3,4\}$

Let

$$\varphi_j(t,\mathbf{x}) = \sum_{w,\mathbf{p}} c_{j,w,\mathbf{p}} \varsigma_{w,\mathbf{p}}(t,\mathbf{x})$$

with $\varsigma_{w,\mathbf{p}}\left(t,\mathbf{x}\right)\overset{def}{=}\exp\left(\mathrm{i}h\left(wt-\mathbf{px}\right)\right)$ be the Fourier series for $\varphi_j\left(t,\mathbf{x}\right)$.

Let $\varphi_{j,w,\mathbf{p}}\left(t,\mathbf{x}\right)\overset{def}{=}c_{j,w,\mathbf{p}}\varsigma_{w,\mathbf{p}}\left(t,\mathbf{x}\right)$.

Let $\langle t,\mathbf{x}\rangle$ be any space-time point.

Denote value of function $\varphi_{k,w,\mathbf{p}}$ at this point as

$$\varphi_{k,w,\mathbf{p}}|_{\langle t,\mathbf{x}\rangle}=A_k$$

and value of function $\partial_t\varphi_{j,w,\mathbf{p}}-\sum_{s=1}^4\sum_{\alpha=1}^3\beta_{j,s}^{[\alpha]}\partial_\alpha\varphi_{s,w,\mathbf{p}}$ at this point as

$$\left(\partial_t\varphi_{j,w,\mathbf{p}}-\sum_{s=1}^4\sum_{\alpha=1}^3\beta_{j,s}^{[\alpha]}\partial_\alpha\varphi_{s,w,\mathbf{p}}\right)|_{\langle t,\mathbf{x}\rangle}=C_j.$$

There A_k and C_j are complex numbers. Hence the following equations set:

$$\left\{\begin{array}{c}\sum_{k=1}^4 z_{j,k,w,\mathbf{p}}A_k=C_j,\\ z_{j,k,w,\mathbf{p}}^*=-z_{k,j,w,\mathbf{p}}\end{array}\right|$$

is a set of 20 algebraic complex equations with 16 complex unknown numbers $z_{k,j,w,\mathbf{p}}$. This set can be reformulated as the set of 8 linear real equations with 16 real unknown numbers $\mathrm{Re}\left(z_{j,k,w,\mathbf{p}}\right)$ for $j<k$ and $\mathrm{Im}\left(z_{j,k,w,\mathbf{p}}\right)$ for $j\leq k$. This set has got solutions by the Kronecker-Capelli theorem. Hence at every point $\langle t,\mathbf{x}\rangle$ such complex number $z_{j,k,w,\mathbf{p}}|_{\langle t,\mathbf{x}\rangle}$ exists.

Let $\kappa_{w,\mathbf{p}}$ be a linear operator on the linear space, spanned by functions $\varsigma_{w,\mathbf{p}}\left(t,\mathbf{x}\right)$, and

$$\kappa_{w,\mathbf{p}}\varsigma_{w',\mathbf{p}'}\overset{def}{=}\left\{\begin{array}{c}\varsigma_{w',\mathbf{p}'},\text{ if }w=w',\ \mathbf{p}=\mathbf{p}';\\ 0,\text{ if }w\neq w'\text{or/and }\mathbf{p}\neq\mathbf{p}'\end{array}\right..$$

Let $Q_{j,k}$ be a operator such that in every point $\langle t,\mathbf{x}\rangle$:

$$Q_{j,k}|_{\langle t,\mathbf{x}\rangle}\overset{def}{=}\sum_{w,\mathbf{p}}\left(z_{j,k,w,\mathbf{p}}|_{\langle t,\mathbf{x}\rangle}\right)\kappa_{w,\mathbf{p}}$$

page 932: line 17: replace expression "complex functions" **by word** "operators".

page 932: line 21 replace by the following text:

and $Q_{j,k}^*=\sum_{w,\mathbf{p}}\left(z_{j,k,w,\mathbf{p}}^*|_{\langle t,\mathbf{x}\rangle}\right)\kappa_{w,\mathbf{p}}=-Q_{k,j}$.