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S
$\int_{t_A}^{t_B} L\mathrm{d}t$
A
B
$\frac{}{\mathrm{d}t\left(\frac{\partial L}{\partial \dot{q}}\right)-\frac{\partial L}{\partial q}=0}$
$\vec{\nabla}\cdot$
$\vec{E}=$
$\frac{\rho}{\epsilon_0}\vec{\nabla}\wedge$
$\vec{E}=$
$-\frac{\partial \vec{B}}{\partial t}$
$\vec{\nabla}\cdot$
$\vec{B}=$
$0\vec{\nabla}\wedge$
$\vec{B}=$
$\mu_0\vec{j}+$
$\epsilon_0\mu_0\frac{\partial \vec{E}}{\partial t}$

$$\gamma = \frac{1}{\sqrt{1-\beta^2}}$$

(1)

β
??

$$\begin{cases} t' = t \\ \vec{r}\,' = \vec{r} - \vec{v}t \\ c\,t' = \gamma\left(ct - \vec{\beta}\cdot\vec{r}_{\parallel}\right) \end{cases}$$

$\vec{r}\,'_{\parallel}=$
$\gamma\left(\vec{r}_{\parallel}-ct\vec{\beta}\right)$
$\vec{r}\,'_{\perp}=$
$\vec{r}_{\perp}$
$\parallel$
$\perp$
$\vec{r}_{\perp}=$
$\vec{r}_{\parallel}+$
$\vec{r}_{\perp}$
ds

$$\mathrm{d}s^2 = c^2\mathrm{d}t^2 - \mathrm{d}\vec{r}^{\,2} = \sum_{\mu=0}^{3}\sum_{\nu=0}^{3} g_{\mu\nu}\mathrm{d}x^{\mu}\mathrm{d}x^{\nu}$$

(2)

c
$(g_{\mu\nu}) = (\,1\,)\,0000-10000-10000-1$

(3)

??
$SO(1,3)$
1
2
$=$
$\mathrm{d}s'^2$
$g_{\mu\nu}\mathrm{d}x^{\mu}\mathrm{d}x^{\nu}=$
$g_{\alpha\beta}\mathrm{d}x'^{\alpha}\mathrm{d}x'^{\beta}$
$=$
$g_{\alpha\beta}\Lambda^{\alpha}{}_{\mu}\Lambda^{\beta}{}_{\nu}\mathrm{d}x^{\mu}\mathrm{d}x^{\nu}$
Λ

$$g = \Lambda^t g \Lambda$$

(4)

Λ
$\mathrm{O}(1,3)$
$\det(\Lambda) = \pm 1$

(5)

$\left(\Lambda_0^0\right)^2=$
$1+$