Vector Formulas

Explicit Forms of Vector Operations

[redacted]

(11.17)

where we have ... $x_3 = y$ and also

(11.18)

The inverse Lor...

(11.16)

$$x_0' = \text{[redacted]}$$

$$\mathbf{x}' = \text{[redacted]} \qquad (11.19)$$

[redacted]

where the paralle[redacted]
velocity $\mathbf{v} = c\boldsymbol{\beta}$. [redacted]
through the seco[redacted]
the invariance, [redacted]

! "#$%"#& ' ()$(#* ' +, "# - *(." ' +$ / &(0 && ' 12* ' 3$1$#&, &#& ' 4&$,#* - &+5$(6.+$#&, &#+$("$(6&$12$,#* - &$(6*($.+$ - "7. ' 8$0 .(6$7&9"4.(:$ $#&9*(.7&$("$#&, &#& ' 4&$,#* - &$1;$

$

<#* ' +, "# - . ' 8$ $* ' 3$ $,.&93+=$

$

$$\mathbf{E} \quad \gamma\, \mathbf{E} \qquad \mathbf{B} \qquad \frac{\gamma}{\gamma} \qquad \bullet\mathbf{E}$$

$$

$$\mathbf{B} \quad \gamma\, \mathbf{B} \qquad \mathbf{E}/c \qquad \frac{\gamma}{\gamma} \qquad \mathrm{i}\mathbf{B}$$

$

: ">$ - .86($>+&$ $\frac{\gamma^2}{\gamma+1} = \frac{\gamma \quad 1}{\beta^2}$ $$.,$: ">$?#&, &#;$

$

<6&$&9&4(#" - *8 ' &(.4$,.&93$(& ' +"#=$

$

$$\begin{pmatrix} 0 & -E_x/c & -E_y/c & -E_z/c \\ E_x/c & 0 & -B_z & B_y \end{pmatrix}$$

$

Thus the gradient drift [illegible]

$$\mathbf{v}_G = \frac{v_\perp^2}{2} \text{ [illegible]}$$

An alternative form, ind[illegible]

$$\frac{\mathbf{v}_G}{\text{[illegible]}} = \text{[illegible]}$$

[illegible]

$$\mathbf{v}_C = \text{[illegible]} \frac{\mathbf{R} \times \mathbf{B}}{R^2 B} \text{ [illegible]}$$

With the definition of $\omega_B = eB$[illegible]

$$\mathbf{v}_C = \frac{v_\parallel^2}{\omega_B R} \left(\frac{\mathbf{R} \times \mathbf{B}}{RB} \right) \text{ [illegible]}$$

[illegible]

$$v_\parallel^2 = v_0^2 - v_{\perp 0}^2 \frac{B(z)}{B_0}$$