A charge q is moving with velocity $\mathbf{u}$ in a uniform magnetic field $\mathbf{B}$.

$$\mathbf{F} = q\mathbf{u} \times \mathbf{B} = m\mathbf{a}$$

If we switch to a different Galilean frame (a low speed Lorentz transform), is the acceleration $\mathbf{a}$ different?

A. Yes
B. No

A charge q is moving with velocity $\mathbf{u}$ in a uniform magnetic field $\mathbf{B}$.

$$\mathbf{F} = q\mathbf{u} \times \mathbf{B} = m\mathbf{a}$$

If we switch to a different Galilean frame (a low speed Lorentz transform), is the particle velocity $\mathbf{u}$ different?

A. Yes
B. No

A charge q is moving with velocity $\mathbf{u}$ in a uniform magnetic field $\mathbf{B}$.

$$\mathbf{F} = q\mathbf{u} \times \mathbf{B} = m\mathbf{a}$$

If we switch to a different Galilean frame (a low speed Lorentz transform), is the magnetic field $\mathbf{B}$ different?

A. Yes
B. No

A charge q is moving with velocity $\mathbf{u}$ in a uniform magnetic field $\mathbf{B}$.

$$\mathbf{F} = q\mathbf{u} \times \mathbf{B} = m\mathbf{a}$$

Suppose we switch to frame with $\mathbf{v} = \mathbf{u}$, so that in the primed frame, $\mathbf{u}' = 0$ (the particle is instantaneously at rest). Does the particle feel a force from an E-field in this frame?

A. Yes
B. No
C. depends on details

ANNOUNCEMENTS

- Extra credit assessment (Wednesday)
  - Replaces second-lowest HW grade
- Last class (Friday)
  - Wrap up and discussion
- Poster presentations (Monday, May 1 from 3-5pm in 1400 BPS)
  - Hand out list of posters to review
  - Hand out review sheets to complete

Minkowski suggested a better way to write K^μ is in terms of the field tensor, $F^{\mu\nu}$,

$$K^\mu = \frac{dp^\mu}{d\tau} = q\eta_\nu F^{\mu\nu}$$

What are the units of the components of the field tensor?

A. $\frac{N}{m}$
B. T
C. $\frac{Ns}{Cm}$
D. $\frac{V}{m}$
E. None or more than one of these

Switch from frame S to frame $\bar{S}$:

How does E_x compare to $\bar{E}_x$?

A. $\bar{E}_x = E_x$
B. $\bar{E}_x > E_x$
C. $\bar{E}_x < E_x$