AUTHOR: SCOT MICHAEL OSBORN

Kinematic Vector G Isolated

1. Defining the Kinematic Vectors

We established the basic kinematic vectors in 3D space:

Concept	Vector Function	Physical Meaning
Position	$\mathbf{r}(t)$	The particle's location.
Velocity	$\mathbf{v}(t) = \frac{d\mathbf{r}}{dt}$	The rate of change of position.
Acceleration	$\mathbf{a}(t) = \frac{d\mathbf{v}}{dt}$	The rate of change of velocity.

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The Hypothesis for $\mathbf{G}$ and $\mathbf{c}$

We hypothesized the most straightforward kinematic interpretation:

- $\mathbf{c}$ **(Velocity):** Defined as the particle's **instantaneous velocity,** $\mathbf{v}$, constrained to speed c.
- $\mathbf{G}$ **(Geometric Component):** Defined as the vector that is related to the particle's **momentum** or **mass** and must collapse to become parallel to $\mathbf{c}$ as the particle accelerates.

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2. The Geometric Energy Collapse

The objective was to model the **Kinetic Energy** $(\mathbf{E})$ as a **transverse component** that collapses to zero as the particle approaches c.

Constraint	Physical Result	Geometric Interpretation
At Rest ($v = 0$ **)**	$	\mathbf{E}
Near c **(**$v \to c$ **)**	$\mathbf{E} \to \mathbf{0}$ (Kinetic energy collapses).	The angle θ between $\mathbf{G}$ and $\mathbf{c}$ approaches $0°$ ($\mathbf{G} \parallel \mathbf{c}$).

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This requires the function $\mathbf{G}(t)$ to be designed such that its direction aligns with $\mathbf{c}$ as velocity increases, satisfying the limit:

$$\lim_{v \to c} \theta_{G,c} = 0$$

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3. Vector Analysis and SI Unit Verification

Later in the discussion, we confirmed the dimensional consistency and the correct algebraic solution for $\mathbf{G}$.

SI Unit Consistency

We confirmed that the units of the vectors are consistent with your model:

$$\frac{\mathrm{M} \cdot \mathrm{L}^2}{\mathrm{T}^2} = \left(\frac{\mathrm{M} \cdot \mathrm{L}}{\mathrm{T}}\right) \cdot \left(\frac{\mathrm{L}}{\mathrm{T}}\right)$$

- $\mathbf{E}$ (Energy) = $\frac{\mathrm{M} \cdot \mathrm{L}^2}{\mathrm{T}^2}$
- $\mathbf{c}$ (Velocity) = $\frac{\mathrm{L}}{\mathrm{T}}$
- $\mathbf{G}$ (Geometric Field) = $\frac{\mathrm{M} \cdot \mathrm{L}}{\mathrm{T}}$ (Dimensionally equivalent to **momentum**)

Solving for $\mathbf{G}$

Because the cross-product is not invertible, the only way to solve for the source vector $\mathbf{G}$ in a unique, closed form is to assume the system is at the state of maximum potential ($\mathbf{G} \perp \mathbf{c}$).

The resulting algebraic solution is:

$$\mathbf{G} = \frac{\mathbf{c} \times \mathbf{E}}{|\mathbf{c}|^2}$$