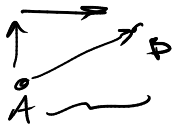
24/09/21

Contexto de la Mecánica → Físico-Matemático

→ Modelos → limitaciones ↔ Hipótesis

Vectorial $\vec{F}$ →



→ · Tiempo.

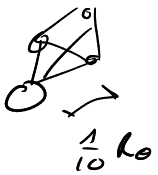
→ · Espacio

· Cinco postulados de Euclides → $\bar{5}^{to}$ líneas paralelas

En la Física Clásica → Geometría Euclídea 5^{to} Sem.

Tiempo → Absoluto

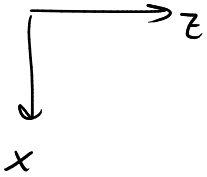
Parámetro El mismo para todos → $t = t'$

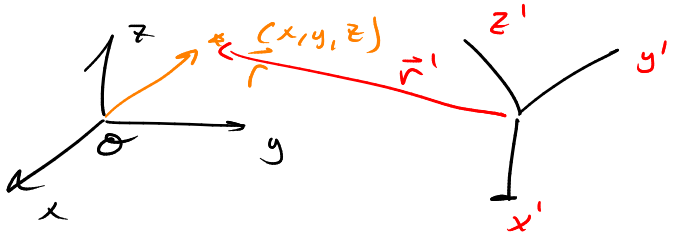


Espacio → Absoluto → Sistema de referencia

Plano

S'





, ═══ I $\mathbb{R}^3 \to (x,y,z)$

$\hookrightarrow \mathbb{E}^3$

Metodología → Hipótesis

↓

Mecánica / Electro / Termo

↳ Ecuaciones de movimiento + Condiciones iniciales

↓

Corroboración

Dimensiones y unidades

Magnitud → "sentido físico fundamental"

Medida relativa para poder comparar → "etiqueta"

T → tiempo
[s]
[h]
[días]

D → distancias
[m], [km]
[mi], [ft]

$v = \frac{\Delta x}{\Delta t} \rightarrow \Delta x = v \Delta t$

→ $v_{\square} \sim 95$ km/h

→ $v_{\square} \sim 115$ km/hr

→ $v \gg v_{\square}$

¿4 hrs en autobus?

3 hr → coche

30 mn → avión

→ 8 min de luz → $c = 3 \cdot 10^5$ km/s

$\Delta t \rightarrow 8_{min}$ $\Delta x = c \cdot \Delta t$

→ CFE → 30 € → 500 Wh → luz

$\frac{J}{s} = W \rightarrow$ Energía / tiempo Potencia

$500\ Wh = 500 \left[\frac{J}{s} \cdot h\right]$ $h = 60\ s$ 3000 J

$[W \cdot h] \sim \frac{F}{T}$

¿Qué son las unidades compuestas / fundamentales?

$[m, s, kg] \rightarrow \frac{[L, T, M]}{g}$

$N = \frac{kg\,m}{s^2}$

$J = Nm = kg\left(\frac{m}{s}\right)^2$

[100] → | M, T, L |

q → | C | → uem
emu

SI → M, T, L, C

| SI | Unidades naturales

| ħ, c, G | = 1

10^{-34} Js 10^{6}

| c = 1 | →

8 me

Corriente → A → $I = \frac{\Delta Q}{\Delta t} = \left| \frac{C}{s} \right|$

Candela
Temperatura →
moles

$\Delta x = c \Delta t$

$| \Delta x = \Delta t |$

$v = \frac{c}{10} = \frac{1}{10}$

$N \to \frac{kg\, m}{s^2}$ cgs dinas 10 dinas = 1N

$J = Nm = \frac{dinas \cdot cm}{10}$

$F = k \frac{q_2 q_1}{r^2}$ $k = 1$

$r^2 \to m^2$

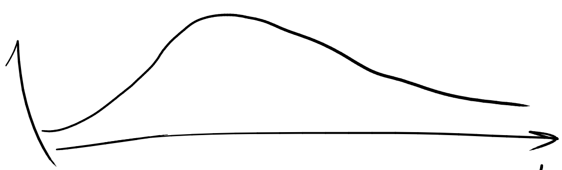
$\left[\frac{kg\, m}{s^2}\right] = \frac{(emu)^2}{m^2}$

$emu = \frac{kg}{s} m^{3/2}$

$F = \frac{1}{4\pi\varepsilon_0} \frac{q_1 q_2}{m^2}$

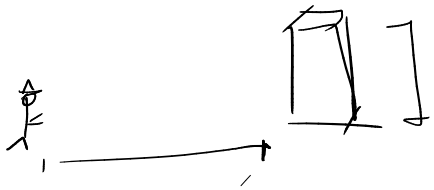
$\frac{C^2}{m^2} \frac{1}{[\varepsilon_0]} = N$

color → longitud de onda



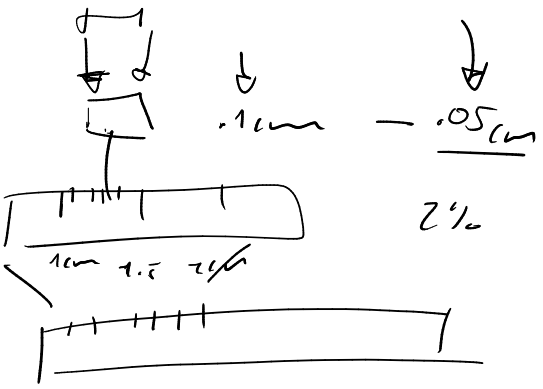
longitud de onda → instrumento

Medición ⟶ Errores o incertidumbres.



50m

⟶ 50m ± 10cm



⟶

$$X = X_0 \pm \delta X_0 \longrightarrow 2X_0 \pm 2\delta X_0$$

$$y = y_0 + \delta y_0 \longrightarrow x+y = (x_0 \pm \delta x_0) + (|y_0| \pm |\delta y_0|)$$

$$= (x_0 - y_0) \cdot \pm (\delta x_0 + \delta y_0)$$

$$x \cdot y = (xy) + (x)(\pm \delta y) + (y)(\pm \delta x) + (\delta x)(\delta y)$$

$$= |xy| \pm (x\delta y + y\delta x)$$

$$\frac{x}{y} = x \cdot y^{-1}$$

$$\frac{1}{y} = \frac{1}{y \pm \delta y} \cdot \frac{y \mp \delta y}{y \mp \delta y}$$

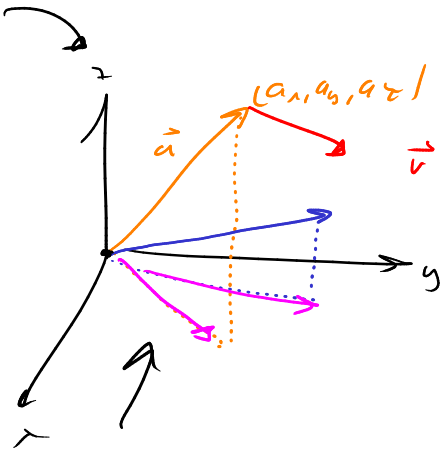
$$= \frac{y \pm \delta y}{y^2 \pm 2y\delta y}$$

$$x \cdot y^{-1} = x \cdot y^{-1} \pm (x\,\delta y^{-1} + y^{-1}\delta x)$$

$$= \frac{x}{y} \pm \left(\frac{x\delta y}{y^2} + \frac{\delta x}{y}\frac{y}{y}\right) = \frac{y}{y^2 \pm 2y\delta y} \pm \frac{\delta y}{y^2 \pm 2y\delta y}$$

$$= \frac{x}{y} \pm \left(\frac{x\delta y + y\delta x}{y^2}\right) = \frac{1}{y} \pm \frac{\delta y}{y^2}$$

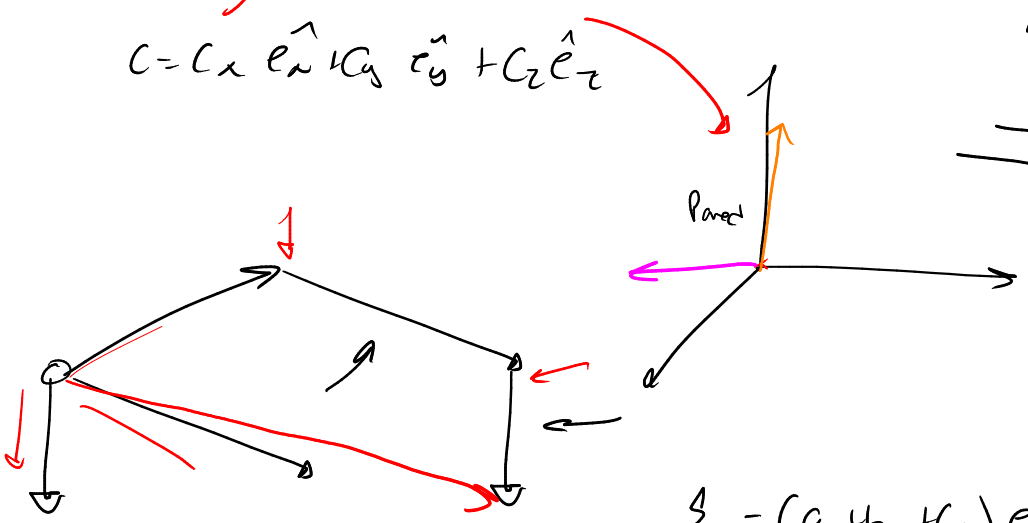
$(x,y,z) = \vec{r} = x\hat{e}_x + y\hat{e}_y + z\hat{e}_z$



$\vec{a} = a_x\hat{e}_x + a_y\hat{e}_y + a_z\hat{e}_z$

$\vec{b} = b_x\hat{e}_x + b_y\hat{e}_y + b_z\hat{e}_z$

$C = C_x\hat{e}_x + C_y\hat{e}_y + C_z\hat{e}_z$



$\Sigma = (a_x + b_x + C_x)\hat{e}_x + \dots$

$a\vec{v}$

$\cdot : V \times V \longmapsto C$

Producto punto

$\vec{a}, \vec{b} \longrightarrow \vec{a}\cdot\vec{b} = \lambda$

↳ Proyecciones.

$\vec{a}\cdot\vec{b} = (a_x b_x + a_y b_y + a_z b_z)$

$= |\vec{a}||\vec{b}|\cos\theta$