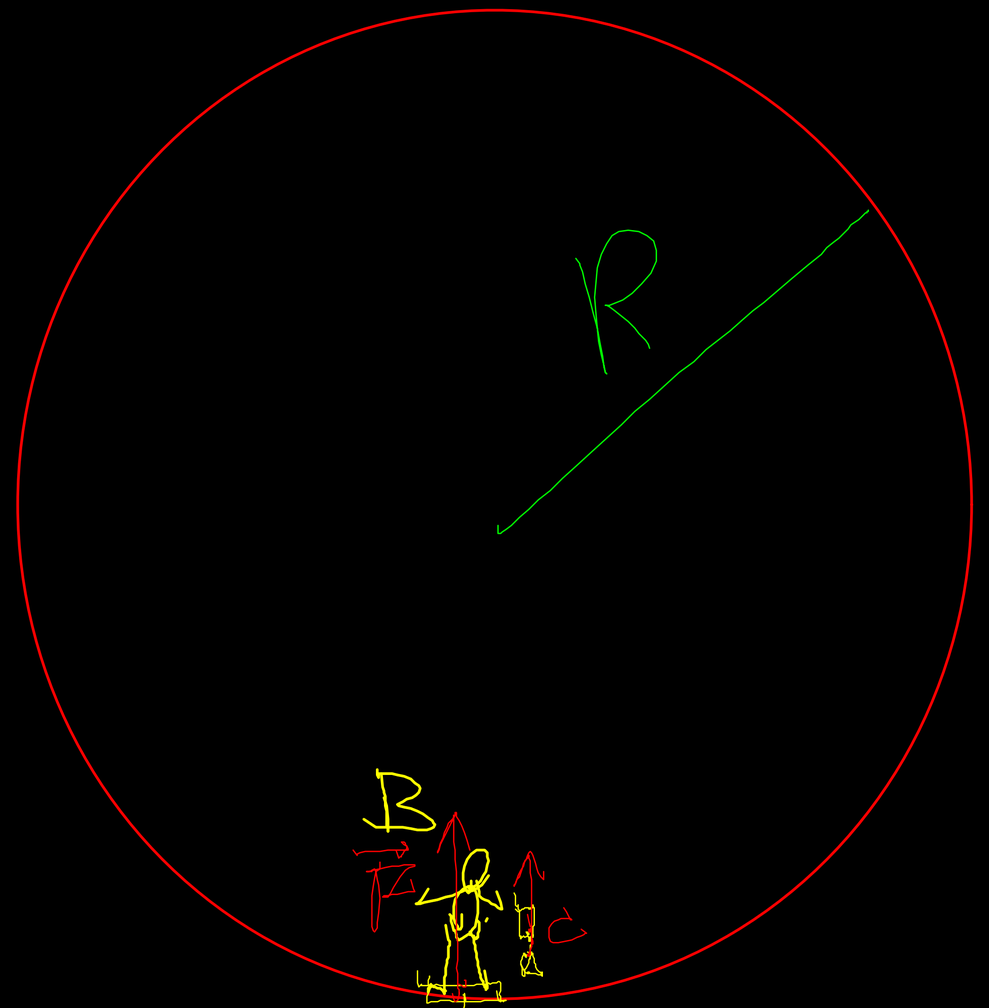
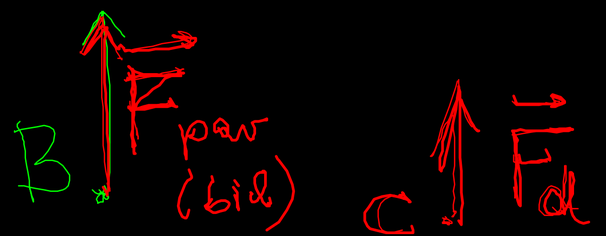


$$\omega = \sqrt{\frac{g}{R}}$$

$$= 0{,}06\,s^{-1}$$



Moto-dinamica in sist. di rif. non-inerziali

Punto di vista di B per corpo P

$$\sum \vec{F}_{ep} = m \vec{a}_{rB}$$

$$\sum \vec{F} = m \vec{a}_B = 0$$

$$\vec{F}_{id} \neq 0$$

Moto-dinamica in sist. di rif. non-inerziali

Punto di vista di B per corpo P

$$\sum \vec{F}_{ep} = m \vec{a}_{rB}$$

$$\sum \vec{F} = m \vec{a}_B = 0$$

$$\vec{F}_{id} \neq 0$$

Richiamo cinematica moti relativi

A inerziale

B (non-inerziale) — in moto

P punto materiale in moto

$$\begin{cases} \vec{r}_{PA} = \vec{r}_{PB} + \vec{r}_{BA} \\ \vec{v}_{PA} = \vec{v}_{PB} + \vec{v}_{trasc} \\ \vec{a}_{PA} = \vec{a}_{PB} + \vec{a}_{trasc} + \vec{a}_{cor} \end{cases}$$

$$\vec{v}_{trasc} = \vec{v}_{BA} + \vec{\omega} \times \vec{r}_{PB}$$

$$\vec{a}_{cor} = 2\vec{\omega} \times \vec{v}_{PB}$$

$$\vec{a}_{trasc} = \vec{a}_{BA} + \vec{\omega} \times \vec{\omega} \times \vec{r}_{PB} + \frac{d\vec{\omega}}{dt} \times \vec{r}_{PB}$$

$$\vec{a}_{pB} = \vec{a}_{pA} - \vec{a}_{trasc} - \vec{a}_{cor}$$

B non-inerziale deve riscrivere Newton

$$m\vec{a}_{pB} = \sum \vec{F} - m\vec{a}_{trasc} - m\vec{a}_{cor}$$

$\sum \vec{F}$: forze dovute alle interazioni sul punto materiale P

$-m\vec{a}_{trasc} - m\vec{a}_{cor}$: forze inerziali apparenti, pseudoforze

Moto-dinamica in sist. di rif. non-inerziali

Punto di vista di B per corpo P

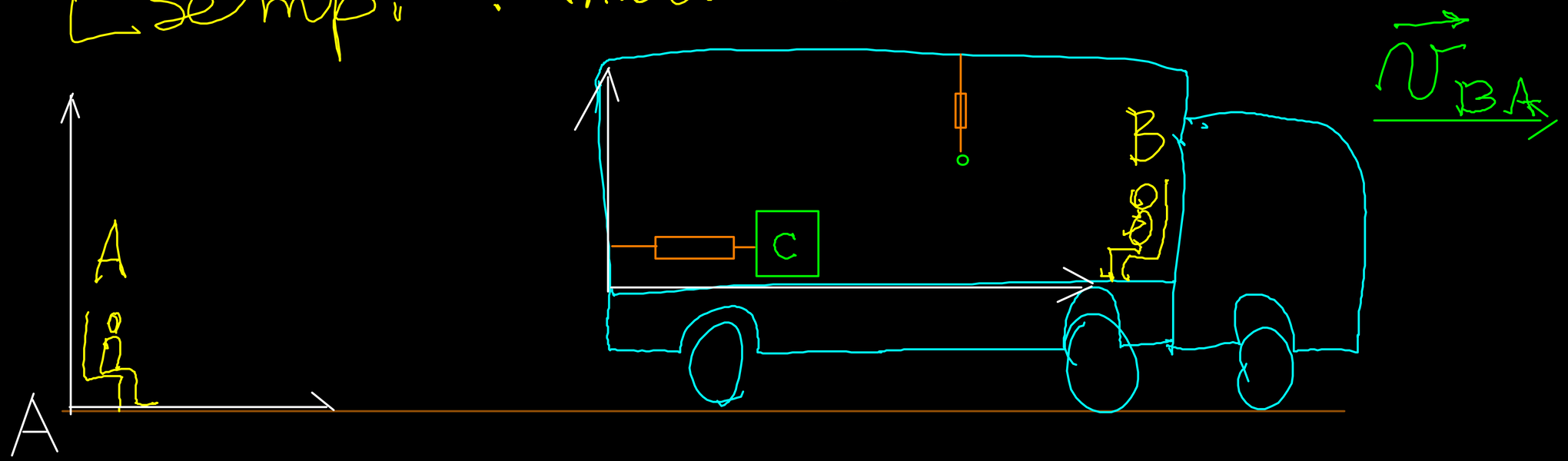
$$\sum \vec{F}_P = m \vec{a}_{PB}$$

$$\sum \vec{F} = m \vec{a}_B = 0$$

$$\vec{F} + \vec{F}_d \neq 0$$

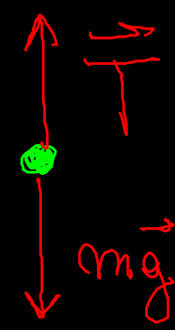
$$\vec{F}_d - m \underbrace{\vec{a}_{tr}}_{-m\vec{\omega}\times\vec{\omega}\times\vec{r}_{PB}} = 0$$

Esempi: moti relativi e accelerometri



1) $\vec{v}_{BA} = \text{cost}$

Per A



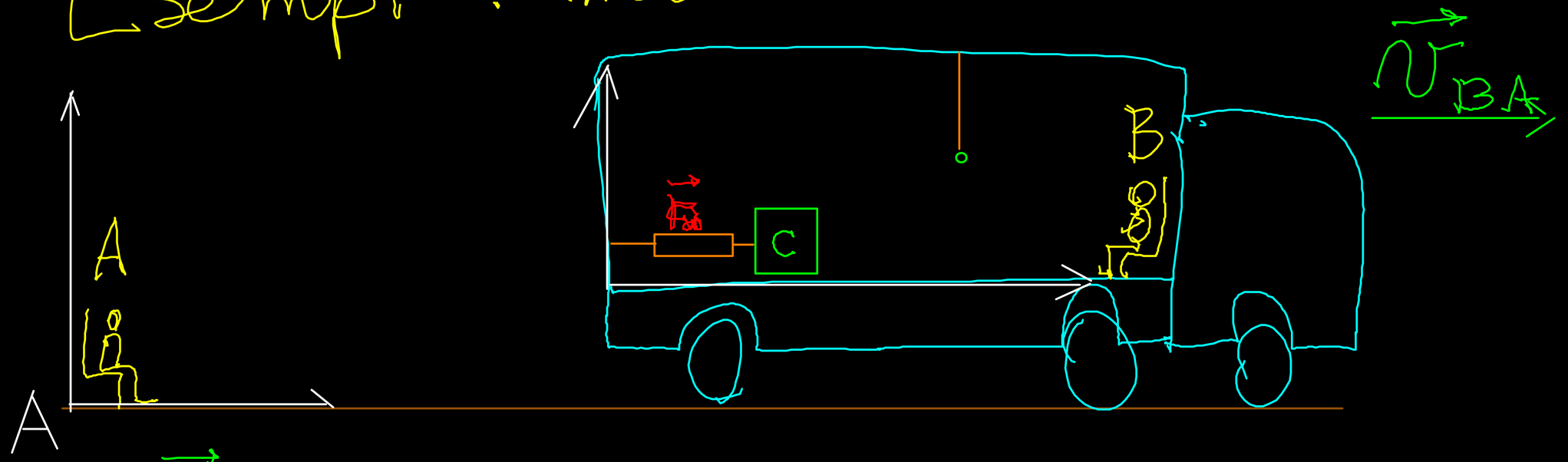
$\sum \vec{F} = m\vec{a}$

$\vec{T} + m\vec{g} = 0$

OK $\vec{v}_{PA} = \vec{v}_{BA}$

Per B

Esempi: moti relativi e accelerometri



1) Per la corsa

$\vec{F}_d = 0$

$\vec{F}_N$

$m\vec{g}$

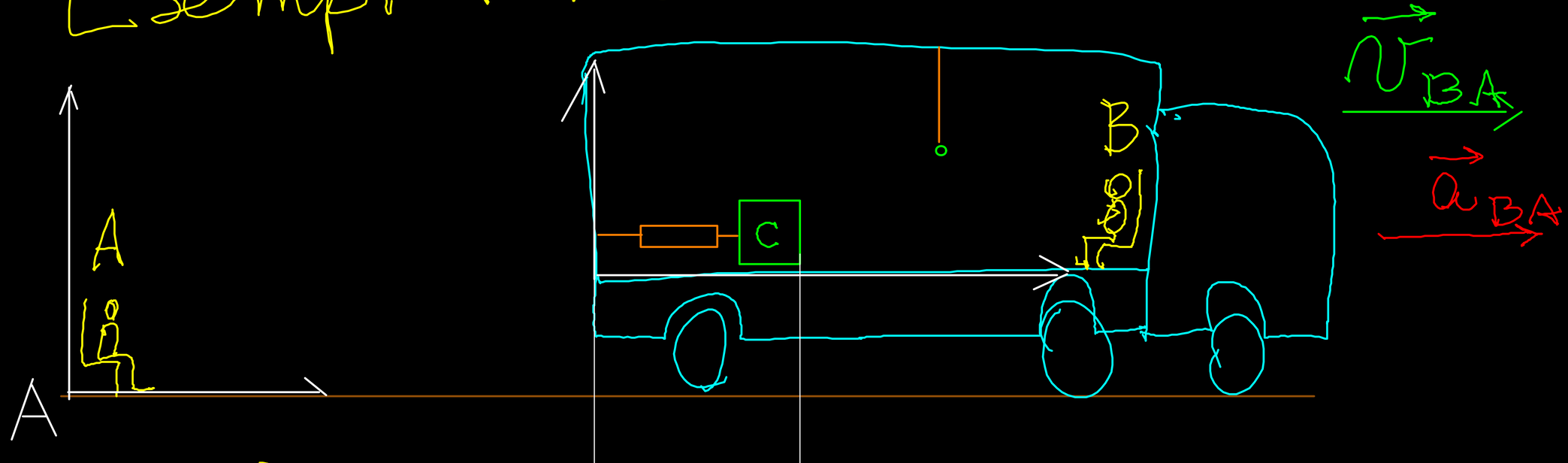
A $\sum \vec{F} = 0$

$\vec{v}_{CA} = \vec{v}_{BA}$

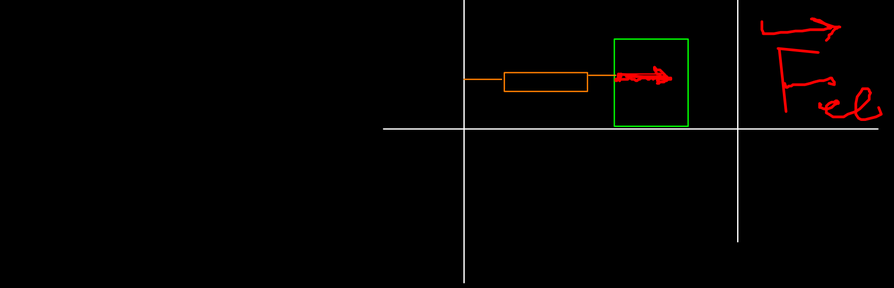
B Come sopra

$\vec{v}_{CB} = 0$

Esempi: moti relativi e accelerometri

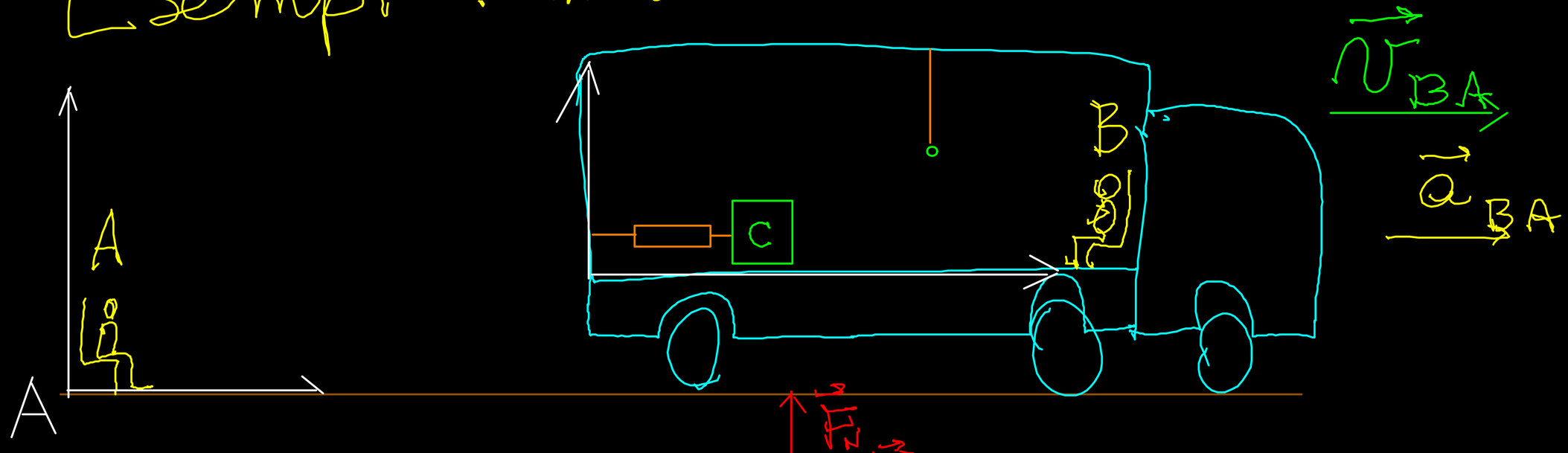


2) $\vec{v}_{BA}$ non costante – $\vec{a}_{BA}$ = cost.
per un Δt lungo



C si sposta a sx

Esempi: moti relativi e accelerometri



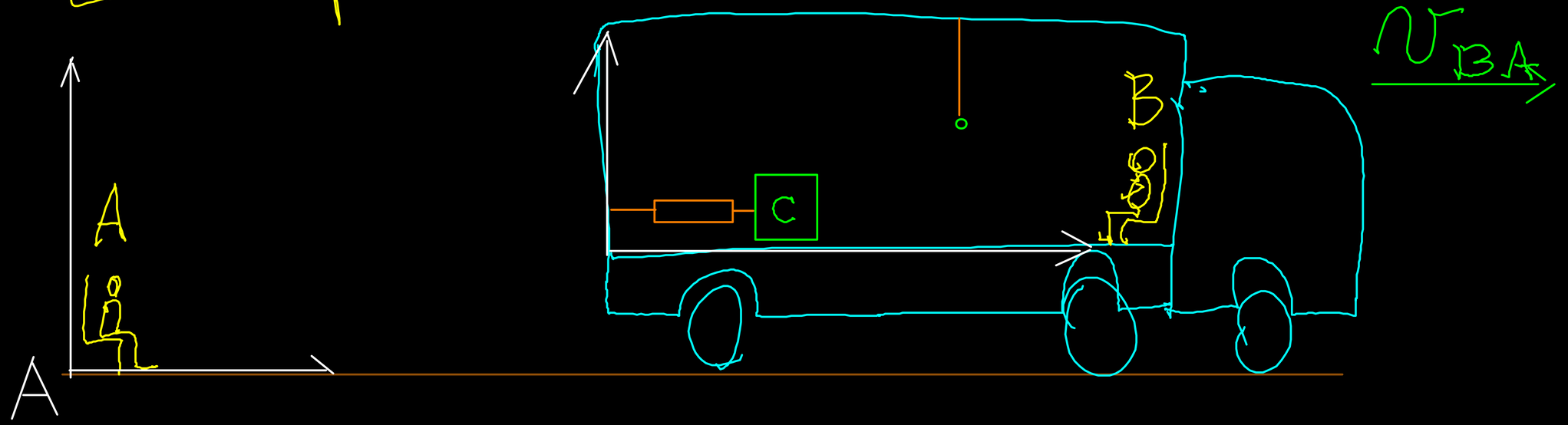
2) $\vec{a}_{BA}$ costante

Per A $\quad \vec{a}_{CA} = \vec{a}_{BA}$

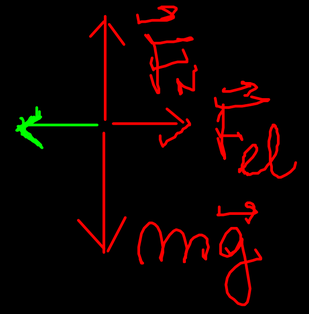
$$\sum \vec{F} = m_c \vec{a}_{CA}$$

$$\vec{F}_{el} = m_c \vec{a}_{BA} \rightarrow \vec{a}_{BA} = -\frac{\vec{F}_{el}}{m_c}$$

Esempi: moti relativi e accelerometri



Per B?



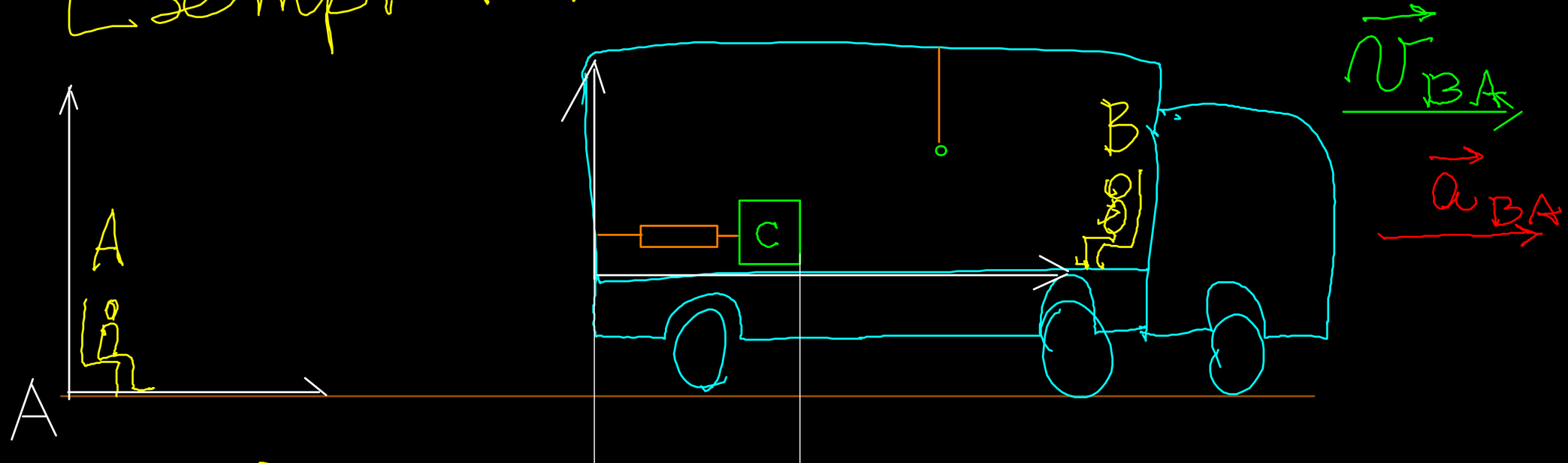
$$\sum \vec{F} - m_c \vec{a}_{BA} = m_c \vec{a}_{cB}$$

$\vec{a}_{cB} = 0$ ($\vec{v}_{cB} = 0$)

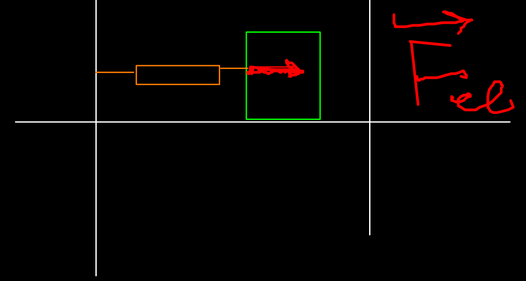
$-m_c \vec{a}_{BA}$: forza inerziale trascinamento traslatorio

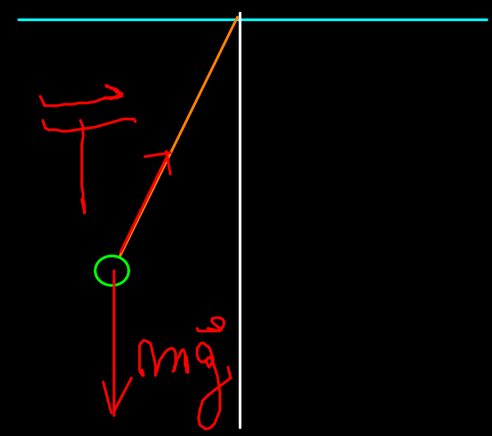
$= 0$

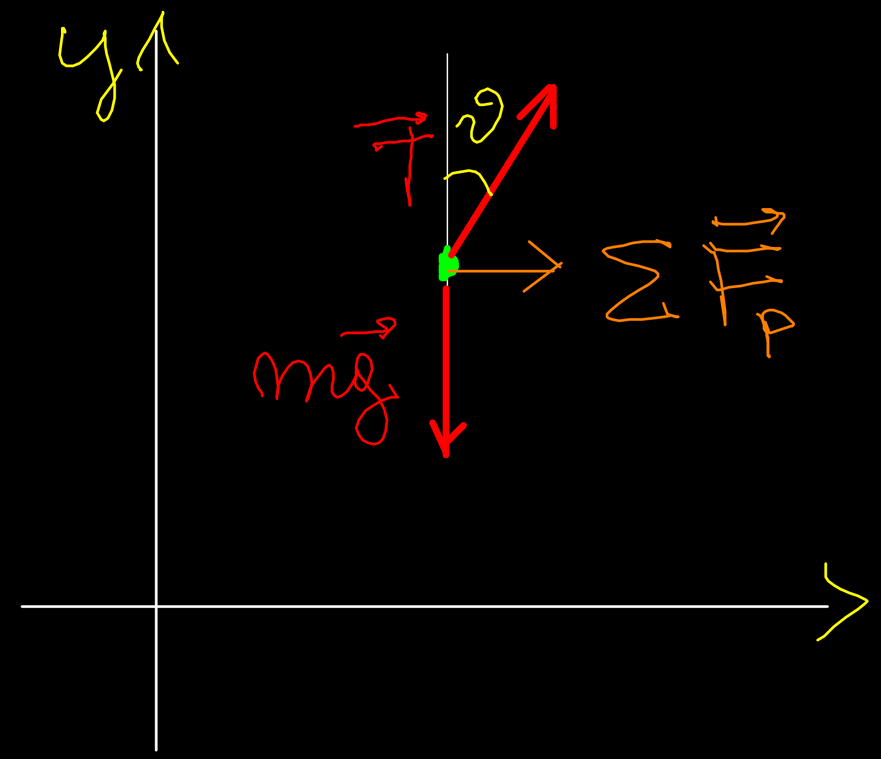
Esempi: moti relativi e accelerometri



2) $\vec{v}_{BA}$ non costante – $\vec{a}_{BA}$ = cost.
per un Δt lungo







Per A $\quad \sum \vec{F} = m_p \vec{a}_{pA}$

$T_y - m_p g = 0$

$T\cos\theta$

$T_x = m_p a_{pAx}$

$T\sin\theta$

$= |\vec{a}_{BA}|$

$a_{BA} = g \operatorname{tg}\theta$

Per B $\quad \sum \vec{F} - m_p \vec{a}_{BA} = m_p \vec{a}_{pB}$

$= 0$