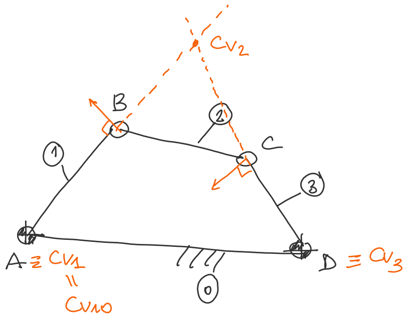
Centro delle velocità dei moi relativi

giovedì 28 novembre 2024 16:47

$C_V \Rightarrow \underline{v}_{CV} = \underline{0}$ per $t = \bar{t}$

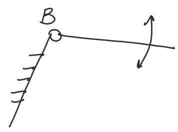
$\Rightarrow \exists$ se $\underline{\omega} \neq \underline{0}$

$\Rightarrow$ TEO CHASLES



MOTO RELATIVO ① e ② $\Rightarrow$ MOTO ROTAT.

$C_{V12} = C_{V21}$
$\shortparallel$
B



$\exists$ un punto C_V t.c. $\underline{v}_{CV①} = \underline{v}_{CV②}$ per $t = \bar{t}$

$\underline{v}^{rel}_{C_V} = \underline{0}$

se $\underline{\omega}^{rel} \neq \underline{0}$

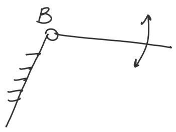
MOTO RELATIVO ① e ② $\Rightarrow$ MOTO ROTAT.

$C_{V12} = C_{V21}\ B \quad \Rightarrow \quad C_{Vij} = C_{Vji}$

$\downarrow$

se "0" = TELAIO

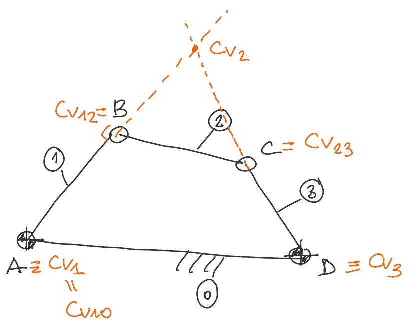
$C_{V10} \equiv C_{V1}$

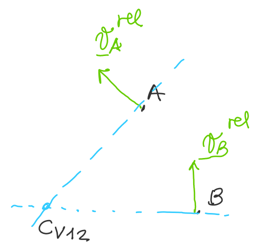


MOTO RELATIVO ② e ③ $\Rightarrow$ MOTO ROTAT

$C_{V23} = C_{V13} = C$

$\boxed{C_{V13}\ ?}$



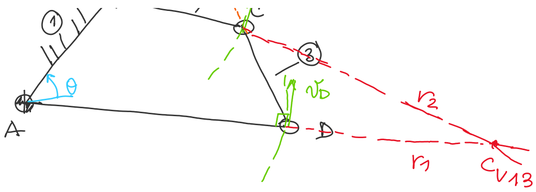


1) TEO CHASLES $\Rightarrow$ $R①$ $R②$

$\Sigma_②$ $\underline{v}^{rel}_{A①}$, $\underline{v}^{rel}_{B①}$

es.

$\Rightarrow$ ② RISPETTO A ①



Σ① ⇒ MOTO RELATIVO DI ③ RISPETTO A ①

Σ① $v_{C③}$

•) Σ① $v_{D③}^{ass} = v_D^{rel} + v_D^{tr}$

$v_D^{rel} = \underbrace{\cancel{v_D^{ass}}}_{0} - \underbrace{v_D^{tr}}_{v_{D①}} = -\dot{\theta}\underline{K} \wedge \vec{AD}$

⊥ v_D^{rel} ⇒ r_1

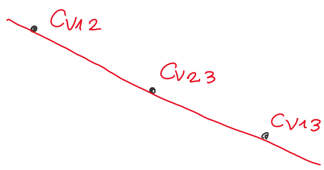
•) Σ① $v_C^{rel} = v_{C③}^{Ass} - v_C^{tr} \sim v_{C③}$

$= \underbrace{\dot{\gamma}\underline{K} \wedge \vec{DC} - \dot{\theta}\underline{K} \wedge \vec{AC}}$

⊥ v_C^{rel} ⇒ r_2

TEO. KENNEDY

$R_1, R_2, R_3 \Rightarrow \overbrace{C_{V12}, C_{13}, C_{V23}}^{\text{TRIPLETTA}}$ sono allineati durante il moto



se un corpo è il telaio

$R_1, R_2, R_0 =$ TELAIO

$C_{V12}, C_{V10}, C_{V20}$

$C_{V10} = C_{V1}$, $C_{V20} = C_{V2}$

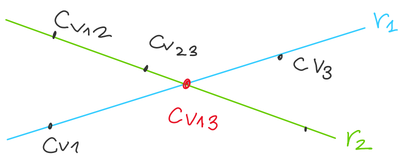
Applicazione:

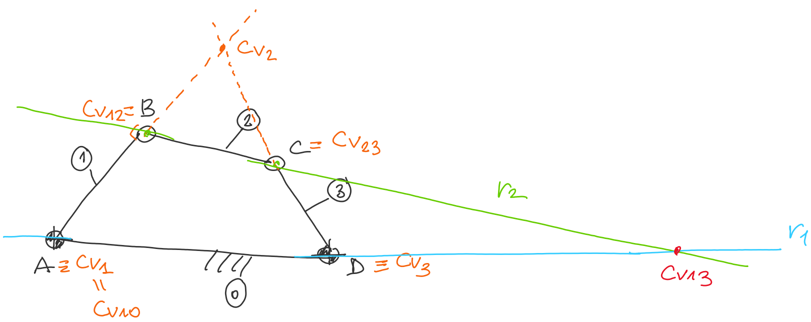
R_1, R_2, R_3, R_4

$C_{V13} \Rightarrow$ INCOGNITA

1, 3, 4 ⇒ C_{V13}?, C_{V14} ($= C_{V1}$), C_{V34} ($= C_{V3}$) → r_1

1, 3, 2 ⇒ C_{V13}?, C_{V12}, C_{V23} → r_2

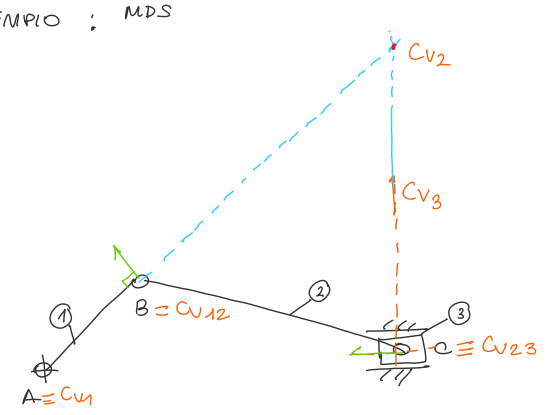




1, 3, 4 ⇒ C_{V13}?, C_{V14} ($= C_{V1}$), C_{V34} ($= C_{V3}$) → r_1

1, 3, 2 ⇒ C_{V13}, C_{V12}, C_{V23} → r_2

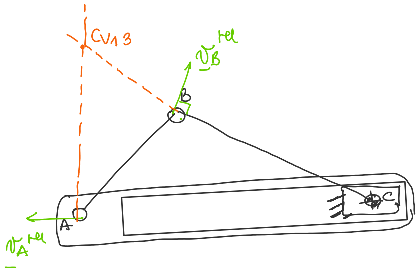
ESEMPIO : MDS



MOTO ASSOLUTO : C_{v1}, C_{v2}, C_{v3}

MOTO RELATIVO : C_{v12}, C_{v23}, C_{v13} ?

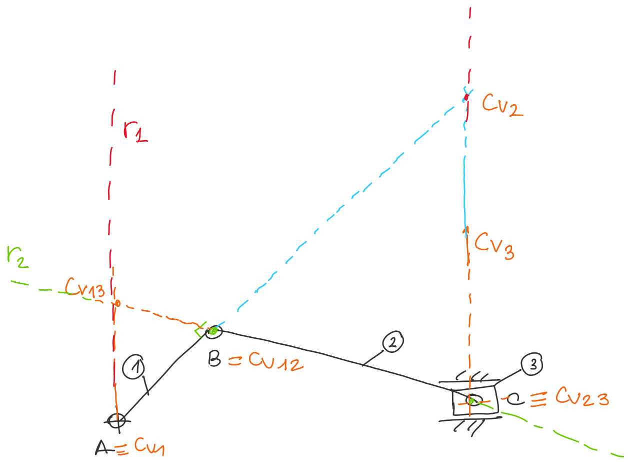
C_{v13} ⇒ TEO CHASLES – MOTO RELAT. 1 vs 3



Σ_3 ⇒ bloccato pistone
⇒ svincolato ∪ telaio

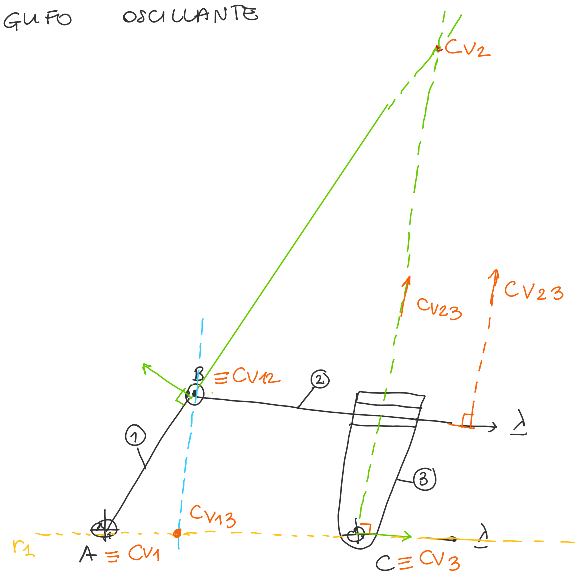
$$\Sigma_3 \quad \underline{v}_{B1}^{rel} = \underline{v}_B^{ass} - \underline{v}_B^{tr} = \dot{\theta}\underline{k} \wedge \overrightarrow{AB} + \dot{s}\underline{i}, \qquad \underline{v}_B^{tr} = \underline{v}_{B\in 3}$$

$$\Sigma_3 \quad \underline{v}_{A1}^{rel} = \underline{v}_A^{ass} - \underline{v}_A^{tr} = \dot{s}\underline{i}$$



C_{v13} <
- 1, 3, 0 ⇒ $(C_{v1}, C_{v3})_{r_1}$, C_{v13}
- 1, 3, 2 ⇒ $(C_{v12}, C_{v23})_{r_2}$, C_{v13}

GLIFO OSCILLANTE



C_{v2} ⇒ TEO CHASLES

•) $\underline{v}_{B2}$

•) $\Sigma_3 \quad \underline{v}_{C2} = \underline{v}_C^{rel} + \underline{v}_C^{tr}$, $\quad \underline{v}_C^{rel} = \dot{s}\underline{\lambda}$, $\quad \underline{v}_C^{tr} = \underline{v}_{C\in 3} = \underline{0}$

C_{v13} <
- 1, 3, 0 ⇒ $(C_{v1}, C_{v3})_{r_1}$, C_{v13}
- 1, 3, 2 ⇒ $(C_{v12}, C_{v23})_{r_2}$, C_{v13}