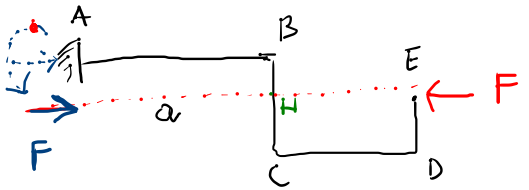
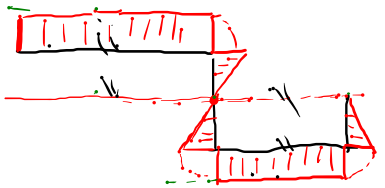
... LINEA DELLE PRESSIONI (CURVA DELLE PRESSIONI)

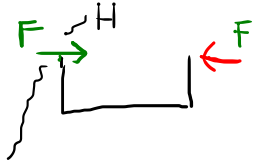
SDC 137IN, 4/12/23



trelth	ldp
AD	∞

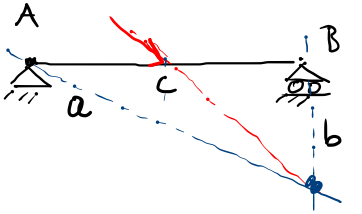


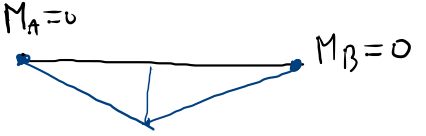
Ⓜ

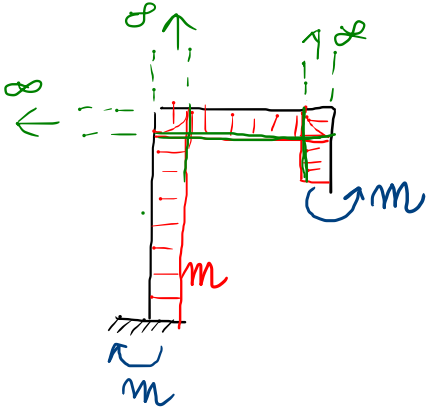


$T_H = +F$, $M_H = 0$

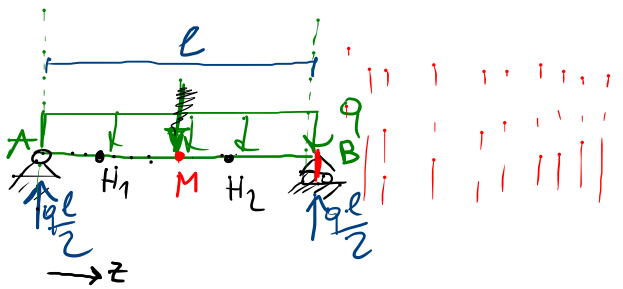
IN H LA LDP INTERSECA LA STRUTTURA: IL MOMENTO FLETTENTE È NULLO.

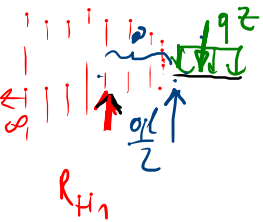


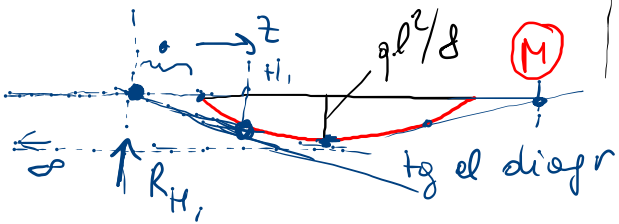




ldp per tutta la struttura è LA RETTA IMPROPRIA





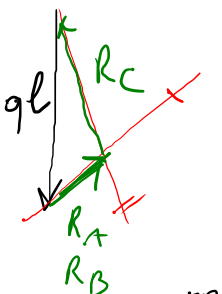


$q_z \leq q\frac{l}{2}$

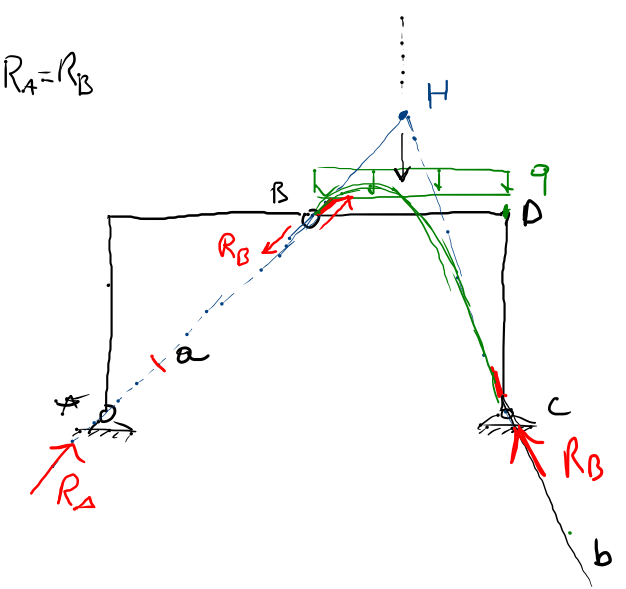
$\frac{ql}{2}$ $H_1 \to M$

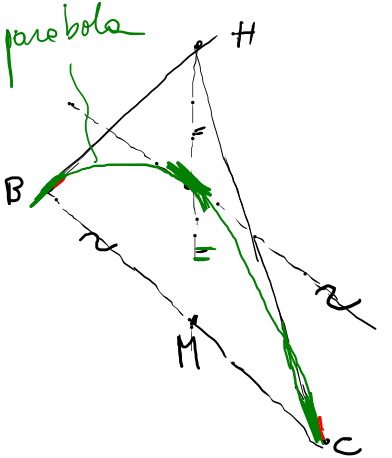
R_{H_1}

TRATTO	LDP
AM	FASCIO DI RETTE VERTICALI // ALLA SIN. DI A
MB	" " " " // ALLA DES. DI B

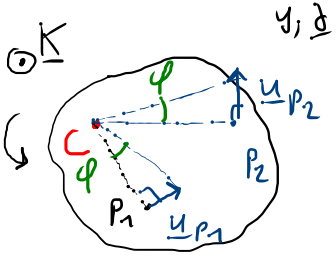


TRATTO	LDP
AB	a
BD	parabola
DC	b





CALCOLO DELLE REAZ. VINCOLARI DELLE STRUTTURE ISOSTATICHE CON IL P.L.V.

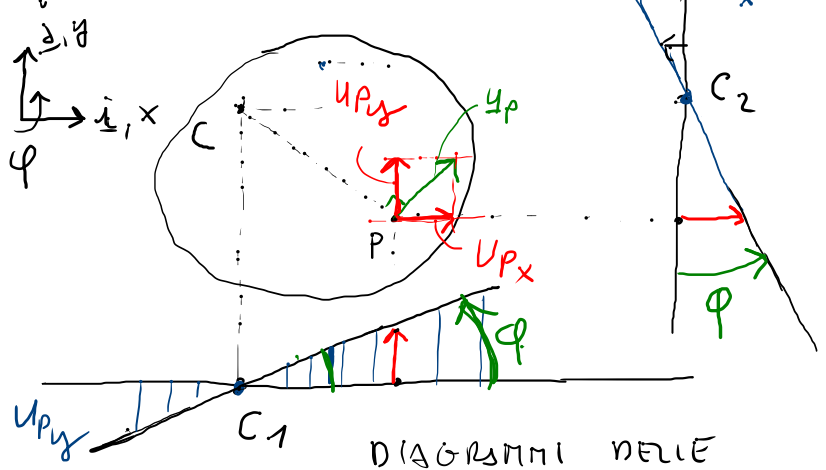


C. RIGIDO

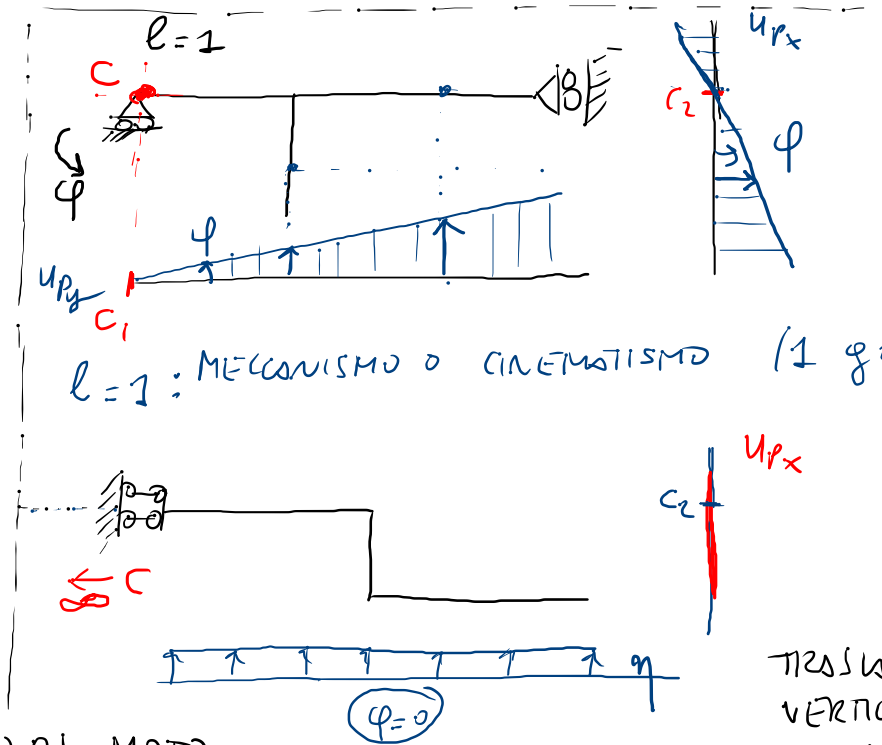
ATTO DI MOTO ROTO-TRASLATORIO

C: CENTRO DI ISTANTANEA ROTAZIONE (C.I.R.) $\underline{u}_C = \underline{0}$

$\underline{u}_P = \underline{\omega} \times \overline{CP}$ $(\underline{\omega} = \varphi \underline{k})$ $\underline{\omega}$: VETTORE ROTAZ. INFINITESIMA

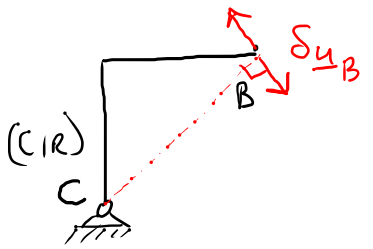


DIAGRAMMI DELLE COMPONENTI DI SPOST. DELL'ATTO DI MOTO



TRASLAZIONE VERTICALE DI INTENSITA' η

CONCETTO
SPOST. VIRTUALE ; OGNI CLASSE DI SPOSTAMENTI INFINITESIMI COMPATIBILE CON I VINCOLI DEL SISTEMA. SE IL SISTEMA È RIGIDO, LA COMPATIBILITÀ VA VERIFICATA ANCHE CON IL VINCOLO DI RIGIDITÀ. $(\delta \underline{u})$



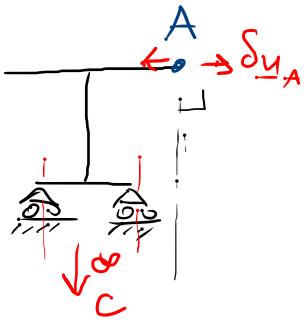
SPOST. VIRTUALE PUNTO B

COSTRUZ. DEL LAVORO VIRTUALE DI UN SIST. DI FORZE APPLICATO AD UN CINEMATISMO

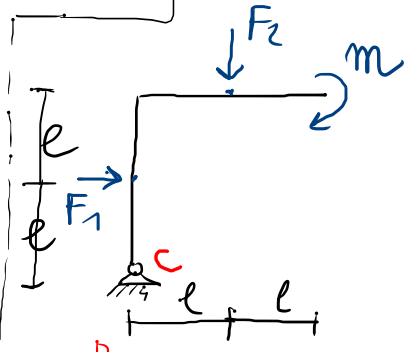
$$\delta L = \sum_i \underline{F}_i \cdot \delta \underline{u}_i + \sum_j M_j \cdot \delta \varphi_j$$

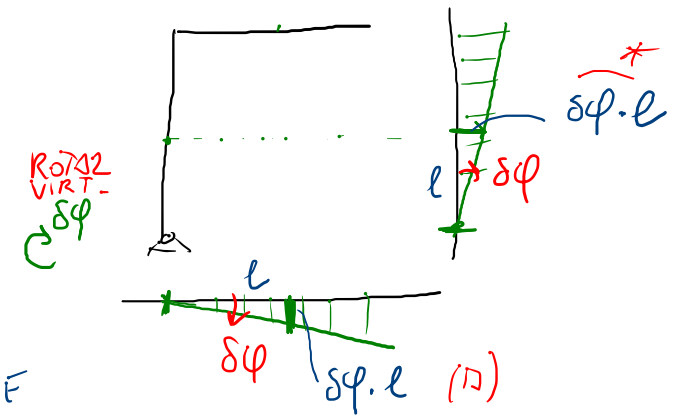
$\underline{F}_i$ ↑ FORZE

M_j ↑ MOMENTI CONCENTRATI



" "
PUNTO A





$$\delta L = F_1 (\delta\varphi\, \ell) + F_2 (\delta\varphi\, \ell) + M\, \delta\varphi$$

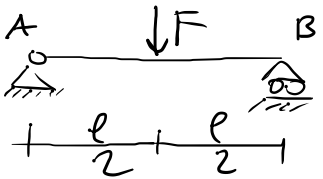
LAVORO VIRTUALE

TEOREMA DEI LAVORI VIRTUALI PER I C. RIGIDI

$L_{ve} = \underbrace{L_{vi}}_{\text{C.R.} \to L_{vi}=0} \Rightarrow \boxed{L_{ve} = 0}$ (NELLA NOTAZIONE USATA IN QUESTA LEZIONE $\boxed{\delta L = 0}$)

C.N.S. per l'equilibrio di un SISTEMA costituito da C. RIGIDI nella configurazione $\mathcal{C}$, libero o soggetto a vincoli lisci, bilaterali, è che il LAVORO VIRTUALE delle forze (momenti) sia nullo per tutti i possibili spost. virtuali a partire da $\mathcal{C}$.

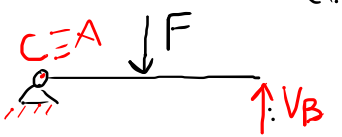
ES



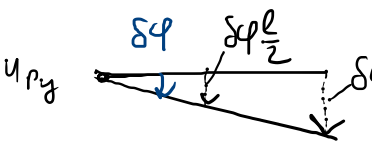
ISO

V_B ? (CON IL P.L.V.)

CINEMATISMO



$\boxed{\delta L = 0, \forall \delta\varphi} \Rightarrow V_B$



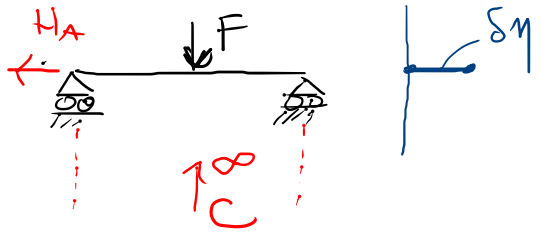
$$\boxed{\delta L \underbrace{L}_{0} + F\,\delta\varphi\,\frac{\ell}{2} - V_B\,\delta\varphi\,\ell = 0, \forall\delta\varphi} \quad \text{ARBITRARIO}$$

$$\left(\frac{F\ell}{2} - V_B\ell\right)\delta\varphi = 0, \forall\delta\varphi$$

$$\frac{F\ell}{2} - V_B\ell = 0 \;;\; \boxed{V_B = +\frac{F}{2}}$$

H_A?

$\delta L = 0, \forall \delta\eta$



$\delta L = F \cdot \phi - H_A \delta\eta = 0, \forall \delta\eta$

$\boxed{H_A = 0}$

$\boxed{\delta L = 0, \forall \delta\eta}$ È UNA CONDIZIONE CHE FORNISCE UNA REAZIONE VINCOLARE ALLA VOLTA.