

2.4.3 Conett. cinem. viscol. intern.

pendolo - bielle - camello interno

esempi

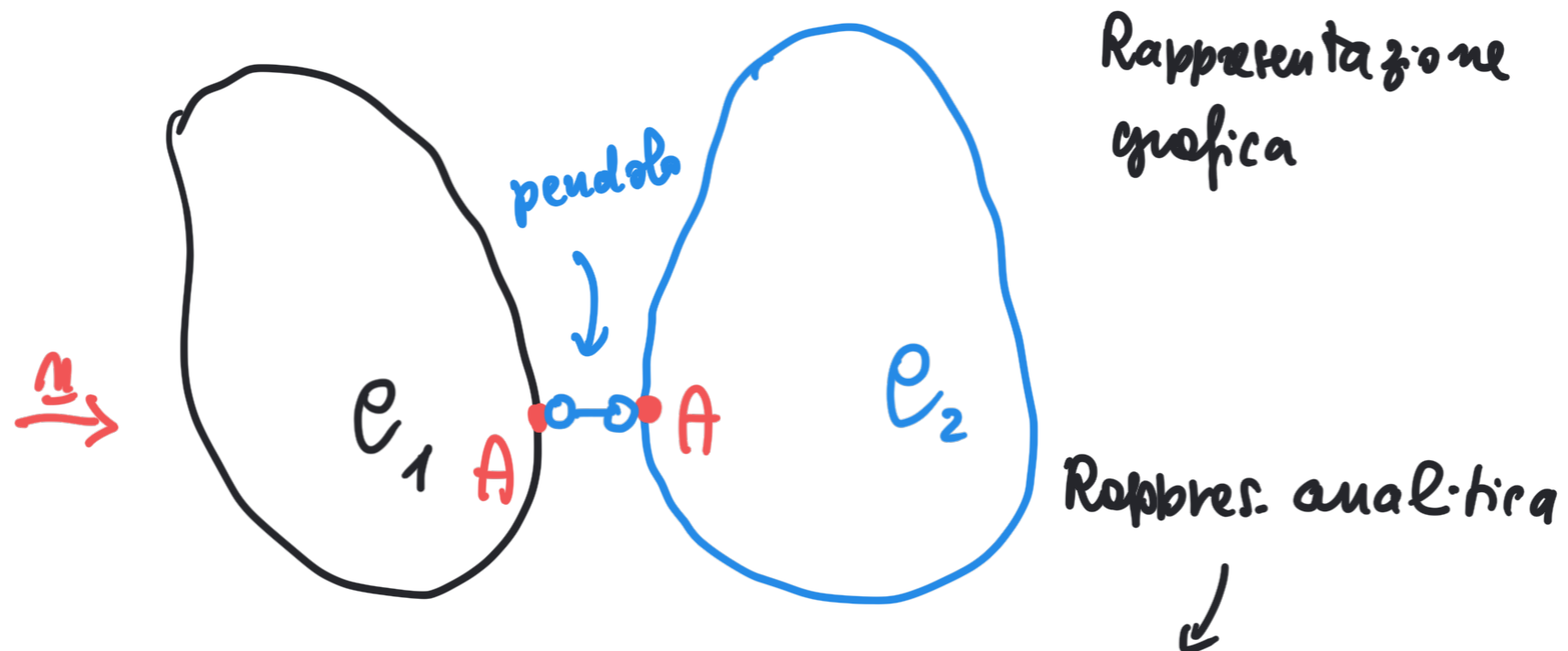
cerniere

glifo - doppio pendolo

ceolimenti

# CARATTERIZZAZIONE CINEMATICA DEI VINCOLI INTERNI

Carrello interno, pendolo, biella



$$\Delta \underline{u} = \underline{u}_2 - \underline{u}_1$$

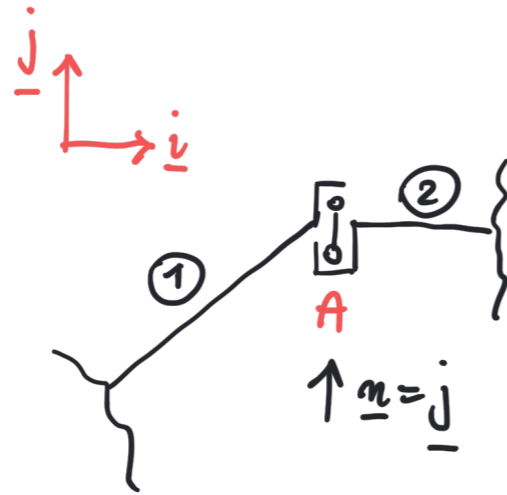
$\underline{n}$  versore

A punto comune

$$\Delta \underline{u}_A \cdot \underline{n} = 0$$

oppure  $(u_{A2} - u_{A1}) \cdot \underline{n} = 0$

ESEMPIO



$$v_{A2} - v_{A1} = 0$$

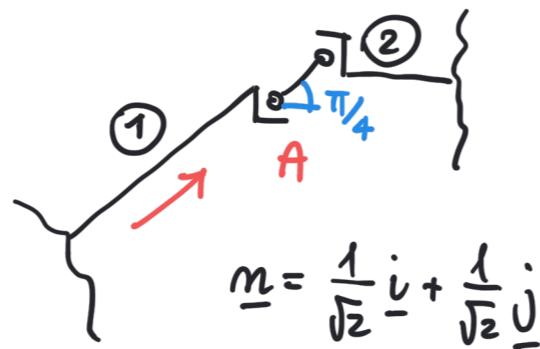
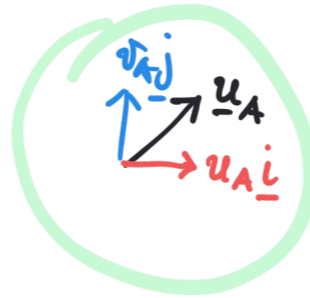
oppure

$$\Delta v_A = 0$$

$$\Delta \underline{u}_A \cdot \underline{j} = \rho$$

$$(\underline{u}_{A2} - \underline{u}_{A1}) \cdot \underline{j} = 0$$

$$\underbrace{\underline{u}_{A2}}_{v_{A2}} \cdot \underline{j} - \underbrace{\underline{u}_{A1}}_{v_{A1}} \cdot \underline{j} = 0$$



$$\underline{m} = \frac{1}{\sqrt{2}} \underline{i} + \frac{1}{\sqrt{2}} \underline{j}$$

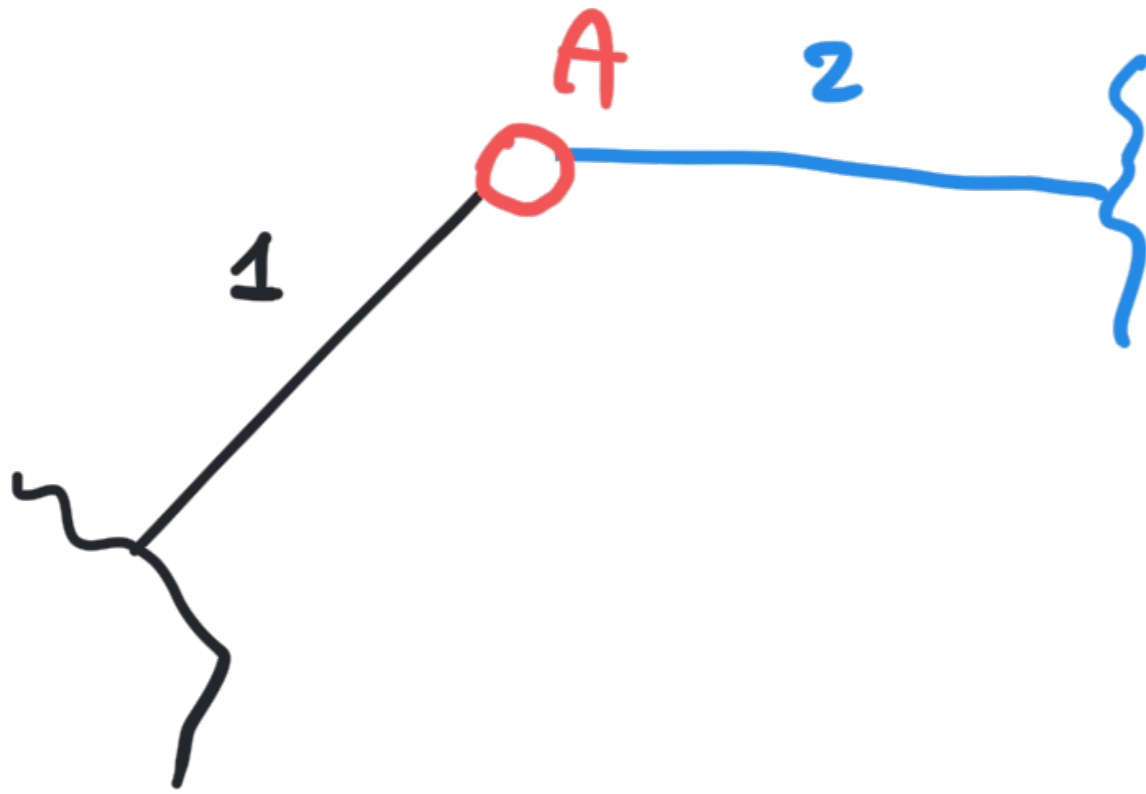
$$(\underline{u}_{A2} - \underline{u}_{A1}) \cdot \underline{m} = 0$$

$$\underline{u}_{A2} \cdot \underline{m} - \underline{u}_{A1} \cdot \underline{m} = 0$$

$$\frac{1}{\sqrt{2}} \underbrace{\underline{u}_{A2}}_{v_{A2}} \cdot \underline{i} + \frac{1}{\sqrt{2}} \underbrace{\underline{u}_{A2}}_{v_{A2}} \cdot \underline{j} - \frac{1}{\sqrt{2}} \underbrace{\underline{u}_{A1}}_{v_{A1}} \cdot \underline{i} - \frac{1}{\sqrt{2}} \underbrace{\underline{u}_{A1}}_{v_{A1}} \cdot \underline{j} = 0$$

$$u_{A2} + v_{A2} - u_{A1} - v_{A1} = 0$$

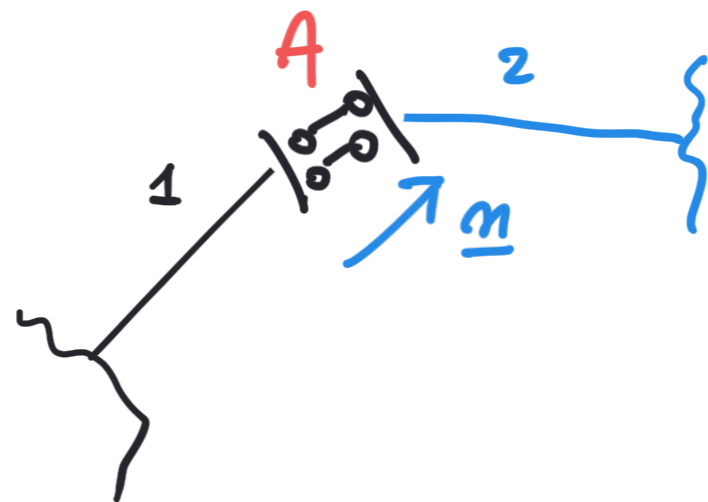
# CERNIERA interna



$$\Delta \underline{u}_A = 0$$

$$\underline{u}_{A2} - \underline{u}_{A1} = 0 \iff \begin{cases} u_{A2} - u_{A1} = 0 \\ v_{A2} - v_{A1} = 0 \end{cases}$$

# Glifo - doppio pendolo

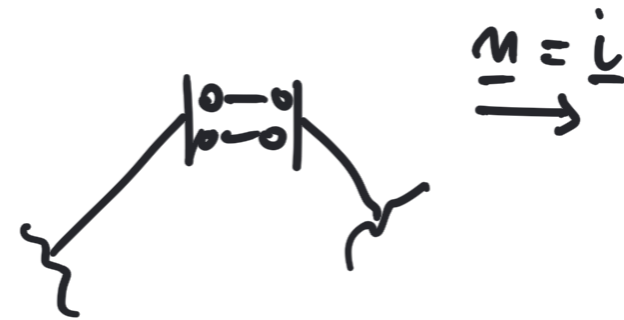


$$\Delta \underline{u}_A \cdot \underline{m} = 0, \quad \Delta \vartheta = 0$$

$$\begin{cases} \underline{u}_{A2} \cdot \underline{m} - \underline{u}_{A1} \cdot \underline{m} = 0 \\ \vartheta_2 - \vartheta_1 = 0 \end{cases}$$

$$\left. \begin{aligned} 0 &= u_{A2} + v_{A2} - u_{A1} - v_{A1} \\ 0 &= \vartheta_2 - \vartheta_1 \end{aligned} \right\}$$

## Esempi:



$$\begin{cases} u_{A2} - u_{A1} = 0 \\ \vartheta_2 - \vartheta_1 = 0 \end{cases}$$

