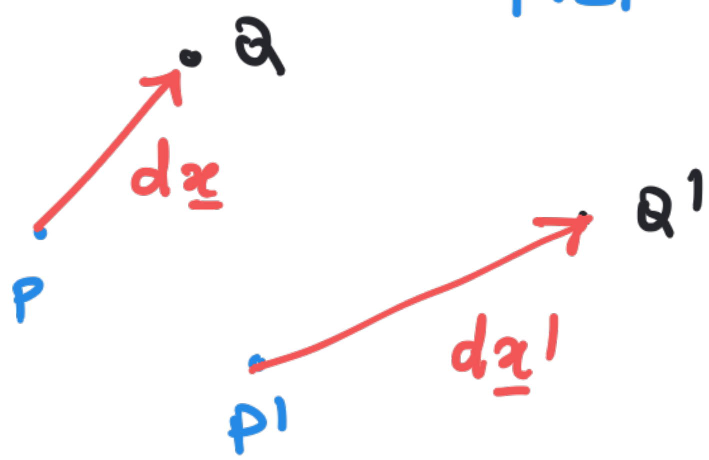
FORMULA DI CAUCHY PER LA DEFORMAZIONE

$\nearrow \underline{n} = \dfrac{d\underline{x}}{|d\underline{x}|}$



$$\varepsilon_n = \frac{|d\underline{x}'| - |d\underline{x}|}{|d\underline{x}|}$$

Hp: $|\underline{F}| \ll 1$

$$\varepsilon_n \simeq \underline{n} \cdot \underline{E}\,\underline{n}$$

$$\underline{F} = \nabla \underline{u} = \underline{E} + \underline{\Omega}, \qquad \underline{E} = \underline{E}^T, \qquad \underline{\Omega} = -\underline{\Omega}^T$$

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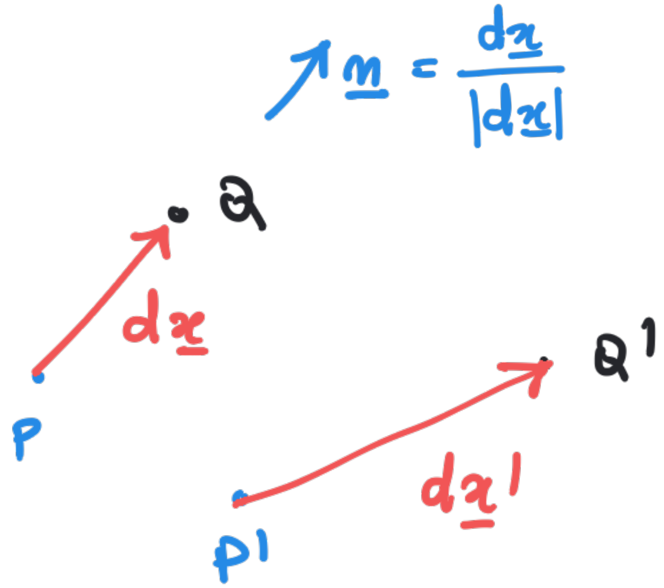
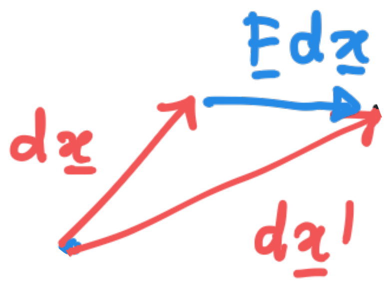


$$\varepsilon_n = \frac{|d\underline{x}'| - |d\underline{x}|}{|d\underline{x}|}$$

Hp: $|\underline{F}| \ll 1$ $\qquad \underline{F} = \nabla \underline{u} = \underline{E} + \underline{\Omega}$, $\quad \underline{E} = \underline{E}^T$, $\quad \underline{\Omega} = -\underline{\Omega}^T$

$$\varepsilon_n \simeq \underline{n} \cdot \underline{E}\,\underline{n}$$

DIM:



$$|d\underline{x}'|^2 = d\underline{x}' \cdot d\underline{x}' = d\underline{x}\cdot d\underline{x} + 2\,\underline{F}d\underline{x}\cdot d\underline{x} + \underline{F}d\underline{x}\cdot\underline{F}d\underline{x}$$

$$d\underline{x}' = d\underline{x} + \underline{F}\,d\underline{x} = (\underline{I} + \underline{F})\,d\underline{x}$$

trascur.

$$|d\underline{x}'| = \sqrt{|d\underline{x}|^2} = \sqrt{|d\underline{x}|^2 + 2\,\underline{F}d\underline{x}\cdot d\underline{x} + \cancel{|\underline{F}d\underline{x}|^2}} \simeq |d\underline{x}|^2 + \underline{F}d\underline{x}\cdot d\underline{x}$$

$$\varepsilon_n \simeq \frac{\underline{F}d\underline{x}\cdot d\underline{x}}{|d\underline{x}|^2} = \underline{F}\frac{d\underline{x}}{|d\underline{x}|}\cdot\frac{d\underline{x}}{|d\underline{x}|} = \underline{F}\,\underline{n}\cdot\underline{n}$$

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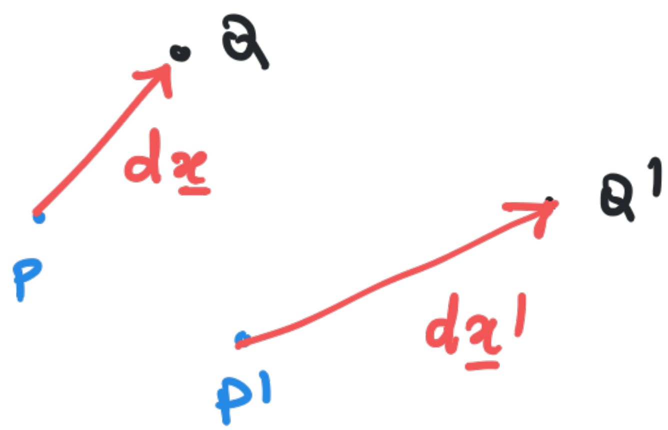
$\underline{n} = \frac{d\underline{x}}{|d\underline{x}|}$



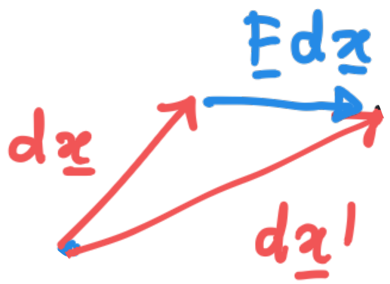
$$\varepsilon_n = \frac{|d\underline{x}'| - |d\underline{x}|}{|d\underline{x}|}$$

Hp: $|\underline{F}| \ll 1$ $\quad \underline{\underline{F}} = \nabla \underline{u}$

$$\boxed{\begin{array}{ccc} \underline{\underline{E}} & + & \underline{\underline{\Omega}} \\ \| & & \| \\ \underline{\underline{E}}^T & & -\underline{\underline{\Omega}}^T \end{array}}$$

$\varepsilon_n \cong \underline{n} \cdot \underline{\underline{E}}\,\underline{n}$

DIM:



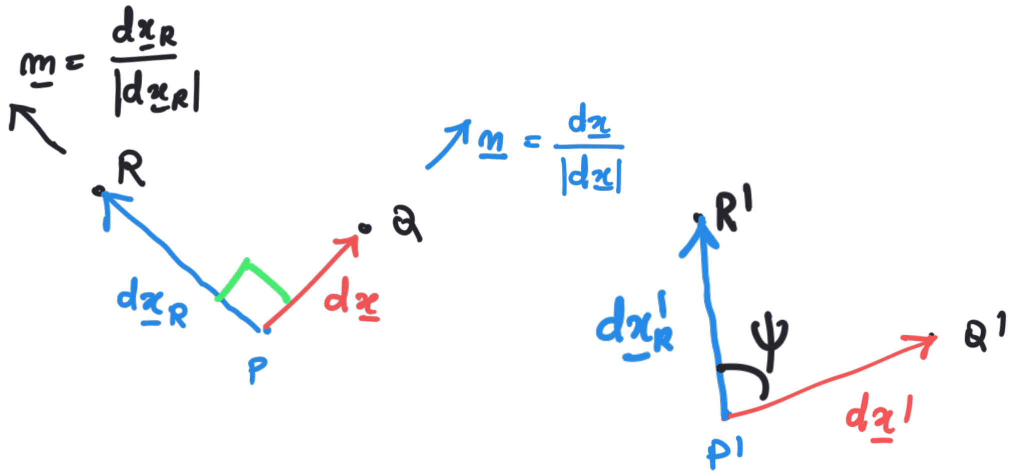
$$d\underline{x}' = d\underline{x} + \underline{\underline{F}}\,d\underline{x}$$
$$= (\underline{\underline{I}} + \underline{\underline{F}})\,d\underline{x}$$

$$|d\underline{x}'|^2 = d\underline{x}' \cdot d\underline{x}'$$
$$= d\underline{x} \cdot d\underline{x} + 2\,\underline{\underline{F}}\,d\underline{x} \cdot d\underline{x}$$
$$+ \underline{\underline{F}}\,d\underline{x} \cdot \underline{\underline{F}}\,d\underline{x}$$

OSS: $\underline{n} \cdot \underline{\underline{\Omega}}\,\underline{n} = -\underline{n} \cdot \underline{\underline{\Omega}}^T \underline{n} = -\underline{\underline{\Omega}}\,\underline{n} \cdot \underline{n} \Rightarrow \underline{n} \cdot \underline{\underline{\Omega}}\,\underline{n} = 0$

$$\varepsilon_n \cong \underline{\underline{F}}\,\underline{n} \cdot \underline{n} = (\underline{\underline{E}} + \underline{\underline{\Omega}})\,\underline{n} \cdot \underline{n} = \underline{\underline{E}}\,\underline{n} \cdot \underline{n} + \cancel{\underline{\underline{\Omega}}\,\underline{n} \cdot \underline{n}}$$

FORMULA DI CAUCHY PER LA DEFORMAZIONE



$$\varepsilon_n = \frac{|d\underline{x}'| - |d\underline{x}|}{|d\underline{x}|}$$

$$\gamma_{nm} = \gamma_{mn} = \pi/2 - \psi$$

Hp: $|\underline{\underline{F}}| << 1$ $\quad \underline{\underline{F}} = \nabla \underline{u}$

$$\varepsilon_n \cong \underline{n} \cdot \underline{\underline{E}}\, \underline{n}$$

$$\boxed{\begin{matrix} \underline{\underline{E}} & + & \underline{\underline{\Omega}} \\ \| & & \| \\ \underline{\underline{E}}^T & & -\underline{\underline{\Omega}}^T \end{matrix}}$$

$$\gamma_{nm} \cong \tfrac{1}{2}\, \underline{m} \cdot \underline{\underline{E}}\, \underline{n}$$

omettiamo la dimostrazione