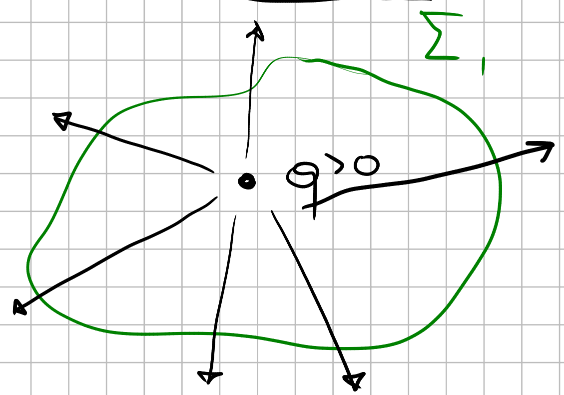
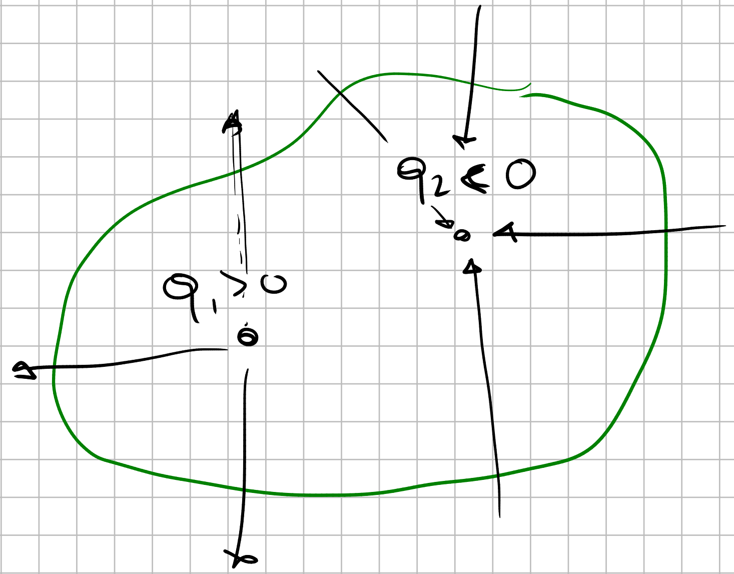
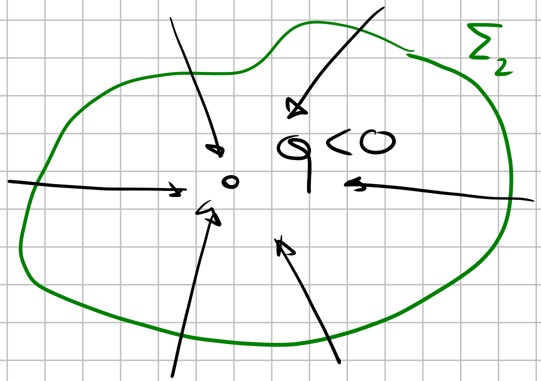
TEOREMA DI GAUSS PER $\vec{E}$

$$\oint_{\Sigma} \vec{E} \cdot \hat{n}\, d\Sigma = \frac{Q_{INT}}{\varepsilon_0}$$



$$\Phi_{\Sigma_1}(\vec{E}) > 0$$

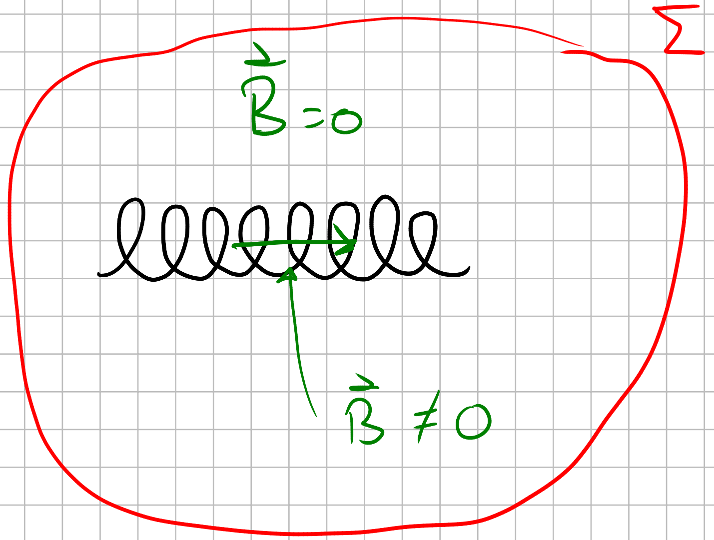




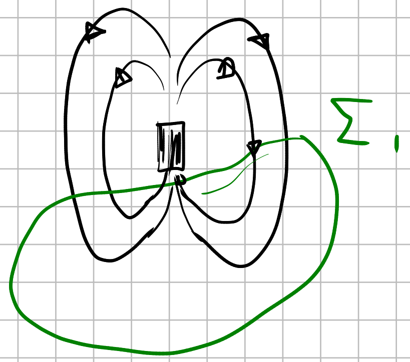
$$\Phi_{\Sigma_2}(\vec{E}) < 0$$

TEOREMA DI GAUSS PER $\vec{B}$

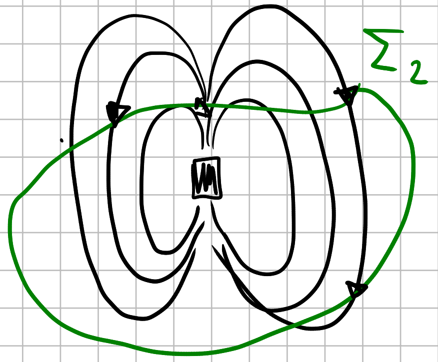
$$\oint_{\Sigma} \vec{B} \cdot \hat{n} \, d\Sigma = 0$$



$$\Phi_{\Sigma}(\vec{B}) = 0$$



$$\Phi_{\Sigma_1}(\vec{B}) = 0$$

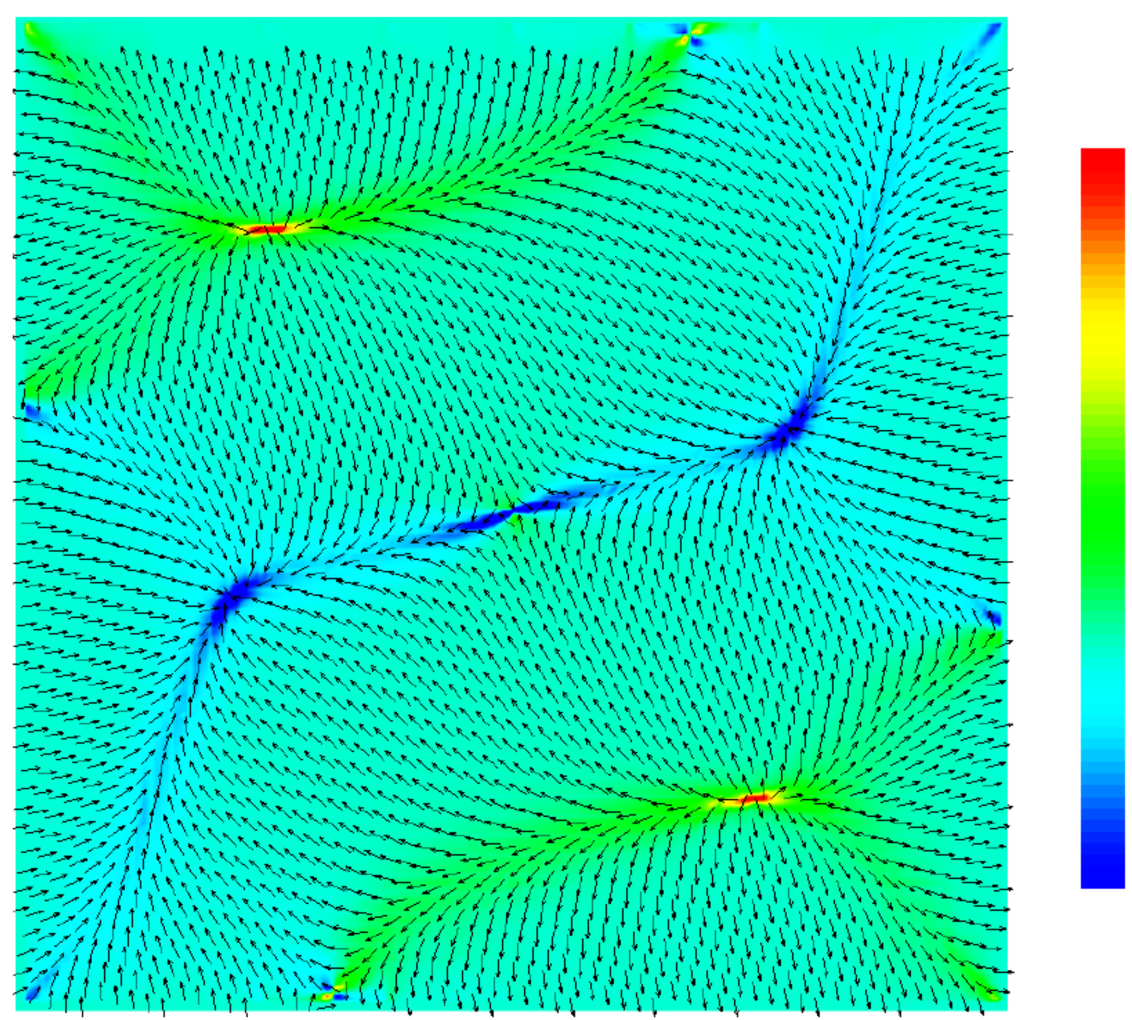


$$\Phi_{\Sigma_2}(\vec{B}) = 0$$

CONSEGUENZA

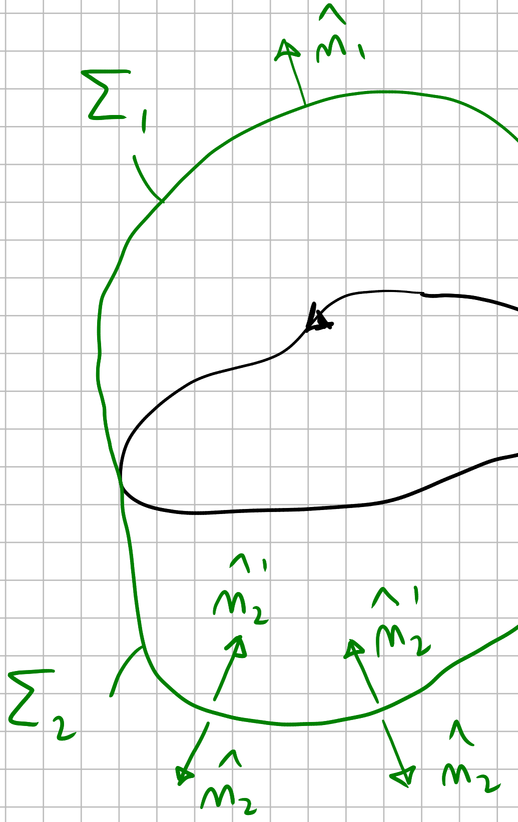
$$\oint_{\Sigma} \vec{B} \cdot \hat{n} \, d\Sigma = \int_{\tau(\Sigma)} \vec{\nabla} \cdot \vec{B} \, d\tau = 0 \Rightarrow \boxed{\vec{\nabla} \cdot \vec{B} = 0} \quad \forall (x, y, z)$$

$$\left(\vec{\nabla} \cdot \vec{E} = \frac{\rho}{\varepsilon_0} \right)$$



CAMPO SOLENOIDALE

$\vec{\nabla} \cdot \vec{B} = 0 \quad \forall\, x, y, z \longrightarrow \vec{B}$ è SOLENOIDALE



$\Sigma = \Sigma_1 + \Sigma_2$

$$\Phi_{\Sigma}(\vec{B}) = \Phi_{\Sigma_1}(\vec{B}) + \Phi_{\Sigma_2}(\vec{B}) = 0 \implies$$

$$\Phi_{\Sigma_1}(\vec{B}) = -\Phi_{\Sigma_2}(\vec{B})$$

$$\Phi_{\Sigma_2}(\vec{B}) = \int_{\Sigma_2} \vec{B} \cdot \hat{n}_2 \, d\Sigma = \int_{\Sigma_2} \vec{B} \cdot (-\hat{n}_2') \, d\Sigma =$$

$$= - \underbrace{\int_{\Sigma_2} \vec{B} \cdot \hat{n}_2' \, d\Sigma}_{\Phi'_{\Sigma_2}(\vec{B})} = -\Phi'_{\Sigma_2}(\vec{B})$$

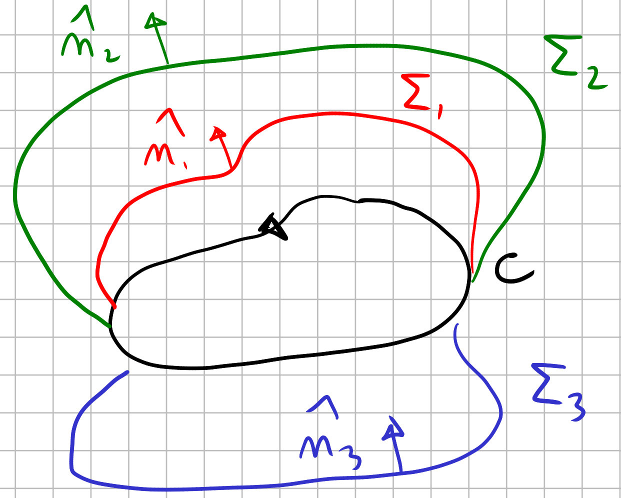
FLUSSO ATTRAVERSO Σ_2 CALCOLATO CON LA NORMALE COERENTE CON C

$$\Phi_{\Sigma}(\vec{B}) = 0 \quad , \quad \Phi_{\Sigma_2}(\vec{B}) = -\Phi'_{\Sigma_2}(\vec{B})$$

NORMALE VERSO L'ESTERNO

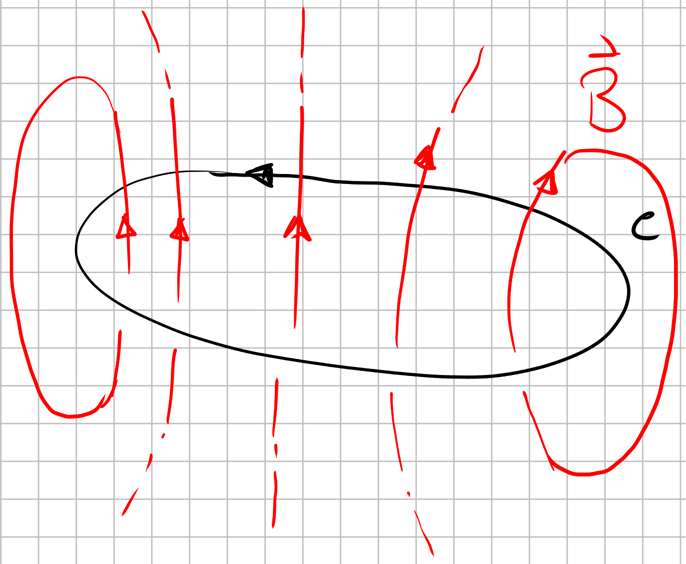
NORMALE COERENTE CON C

$$\boxed{\Phi_{\Sigma_1}(\vec{B}) = -\Phi_{\Sigma_2}(\vec{B}) = \Phi'_{\Sigma_2}(\vec{B})}$$



$$\Phi_{\Sigma_1}(\vec{B}) = \Phi_{\Sigma_2}(\vec{B}) = \Phi_{\Sigma_3}(\vec{B}) = \Phi_{\Sigma_{\text{QUALSIASI}}}(\vec{B})$$

purché costruite su C e con normale coerente al suo verso di percorrenza



$$\Phi_{\Sigma(C)}(\vec{B}) = \text{COSTANTE}$$

FLUSSO CONCATENATO A C