3. Maxwells ligninger på differensialform

Integralform:

Gauss: $\oint_S \vec{E} \cdot d\vec{A} = q/\varepsilon_0$ (lukket flate S)

Faraday-Henry: $\oint_c \vec{E} \cdot d\vec{l} = -\frac{d}{dt} \int_S \vec{B} \cdot d\vec{A}$ (åpen —"—)

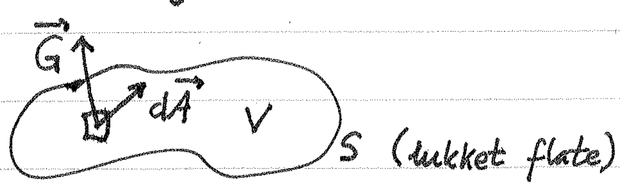
Gauss: $\oint_S \vec{B} \cdot d\vec{A} = 0$ (lukket —"—)

Ampere-Maxwell: $\oint_c \vec{B} \cdot d\vec{l} = \mu_0 I + \mu_0 \varepsilon_0 \frac{d}{dt} \int_S \vec{E} \cdot d\vec{A}$ (åpen —"—)

"Kilder":

$$q = \int_V \rho \, dV \qquad I = \int_S \vec{j} \cdot d\vec{A}$$

Divergensteoremet: $\oint_S \vec{G} \cdot d\vec{A} = \int_V (\nabla \cdot \vec{G}) \, dV$



$$\nabla \cdot \vec{G} = \left(\hat{x}\frac{\partial}{\partial x} + \hat{y}\frac{\partial}{\partial y} + \hat{z}\frac{\partial}{\partial z}\right) \cdot \left(G_x \hat{x} + G_y \hat{y} + G_z \hat{z}\right)$$

$$= \frac{\partial G_x}{\partial x} + \frac{\partial G_y}{\partial y} + \frac{\partial G_z}{\partial z}$$ = divergensen til $\vec{G}$ (i kartesiske koordinater)

$\nabla \cdot \vec{G}$ er en <u>skalar</u>