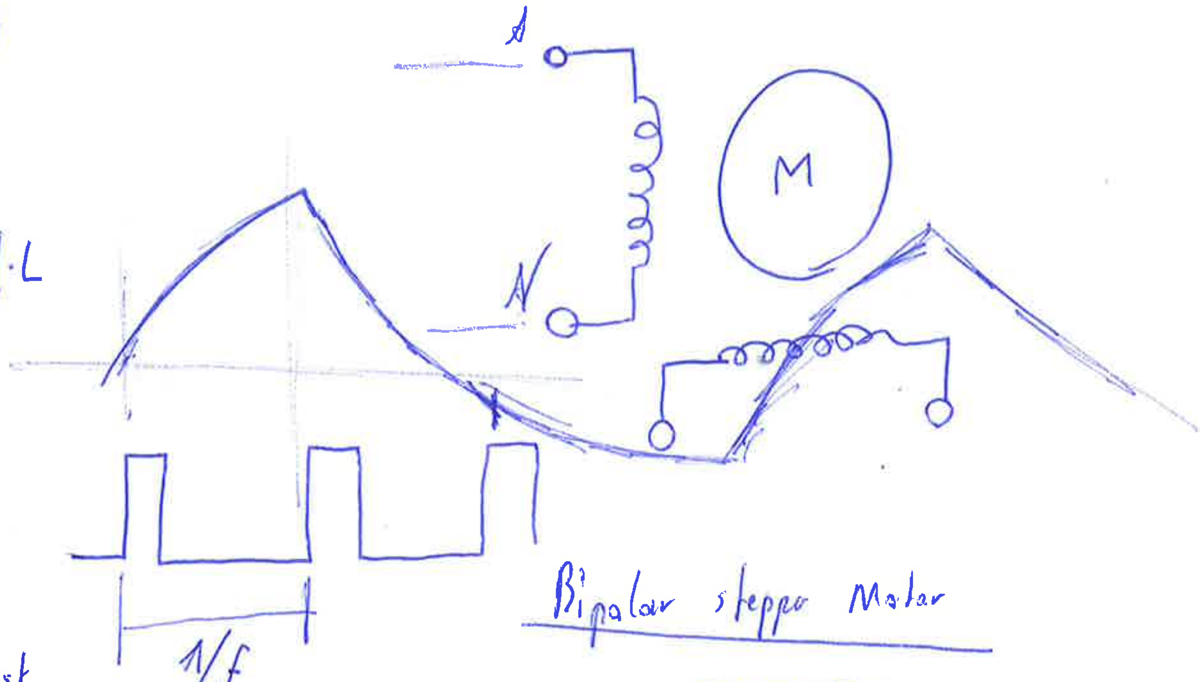
Inductance

$i(t) \approx \frac{1}{L} \cdot \int u(t)\,dt$

if $u(t) = \cancel{\emptyset}$ const

$i(t) = \frac{1}{L} \cdot Ut \quad |:U \quad |\cancel{A}|\cdot L$

$\cancel{U} = t$



more generalized

$i(t)=\frac{1}{L}\int u(t)\,dt$

↳ if $u(t) = U \Rightarrow$ const

$\cancel{i}$ ↳ $\frac{1}{L}\cdot Ut = i(t) \quad |:U \,|\cdot L$

$t = \frac{i(t)\cdot L}{U}$ where $i(t)$ = const (messured)

$t_R = n\cdot t \quad f_R = \frac{1}{t}$

$\omega_R = \frac{1}{t_R} = \frac{1}{n\cdot t} = \frac{U}{n\cdot i(t)\cdot L} = \frac{f_R}{n}$

$i(t) \Rightarrow$ change in current per step

$\Rightarrow i(t) = 2\cdot I_{max} \left(1-e^{-\frac{t}{\tau}}\right)$

$U_C(t) = U_{MAX}\cdot \cancel{e^{\frac{t}{R\cdot C}}} \quad \tau_c = RC$

General charging formula

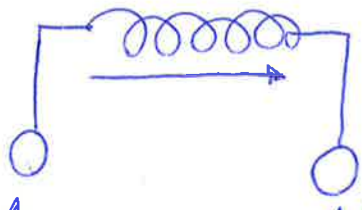
$V(t) = P\cdot \cancel{e^{\frac{t}{\tau}}} \left(1-e^{-\frac{t}{\tau}}\right)$ V... Value t...time P... Potential

$I_c(t) = I_{max}\cdot\left(1-e^{-\frac{t}{\tau_c}}\right) \quad \tau_c = \frac{L}{R}$

$I_{SAT} = 2 I_{SAT}\cdot\left(1-e^{-\frac{t}{\tau_c}}\right) \quad |:I_{SAT}$

$I_{SAT} = (I_{SAT}+I_{MAX})\left(1-e^{-\frac{t}{\tau_c}}\right) - I_{SAT} \quad |+I_{SAT}$

Bipolar stepper Motor



A A/ (A)

B B/ (B)

1 → 2 Flip (A)

~~Flip~~

2 → 3 Flip (B)

3 → 4 Flip (A)

4 → 1 Flip (B)