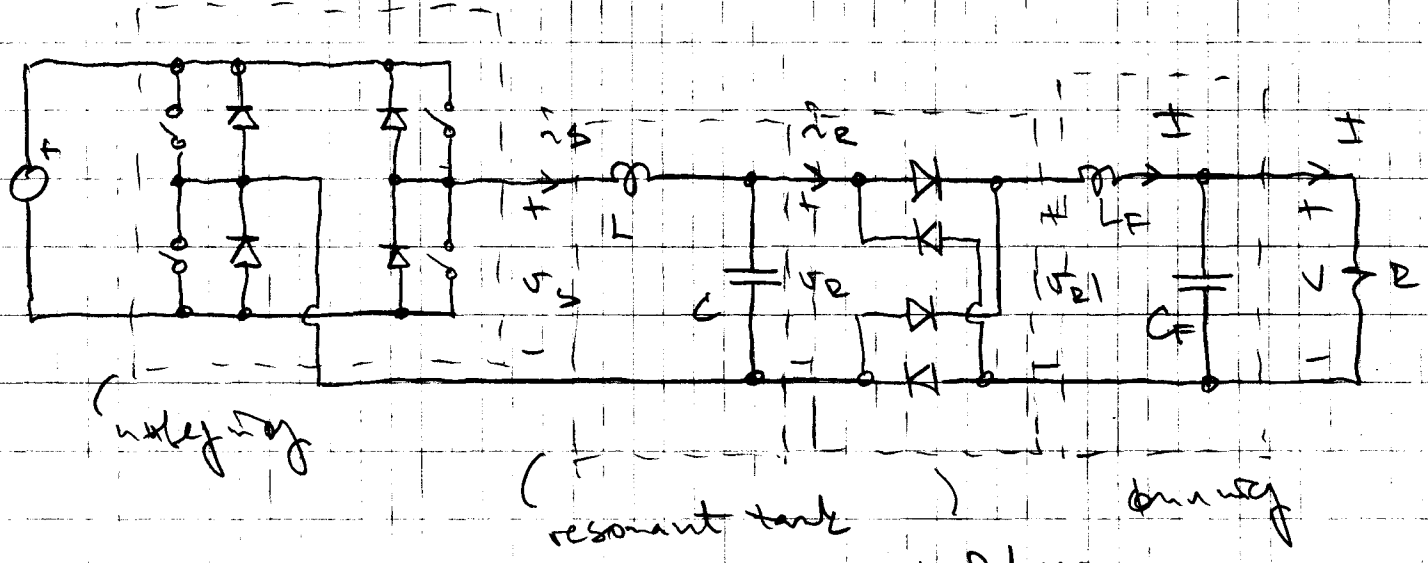
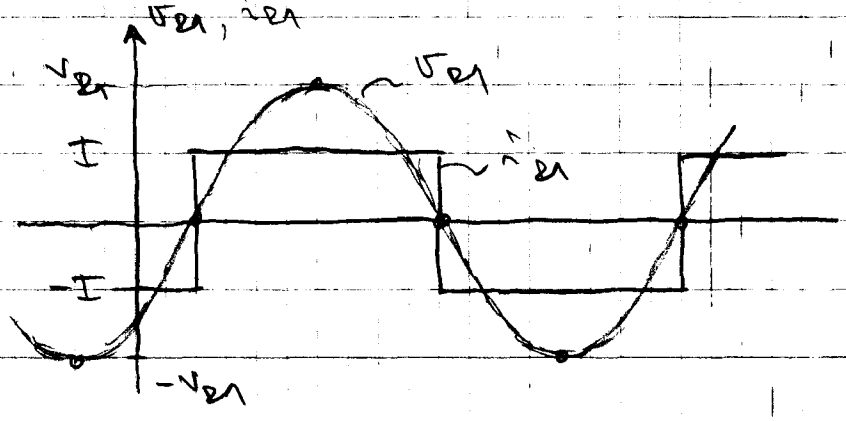
Паралелна резонантна конверзија



- инвертор работи на висока и константна f_s

- исправувач оптоварен, current-loaded



$$v_{R1} = \hat{v}_{R1} \sin(\omega_s t - \varphi_R)$$

$$i_{R1} = \frac{4I}{\pi} \sin(\omega_s t + \varphi_R)$$

(јасно коло)

$$\frac{\hat{v}_{R1}}{\hat{i}_{R1}} = \frac{\pi}{4} \frac{V_{R1}}{I}$$

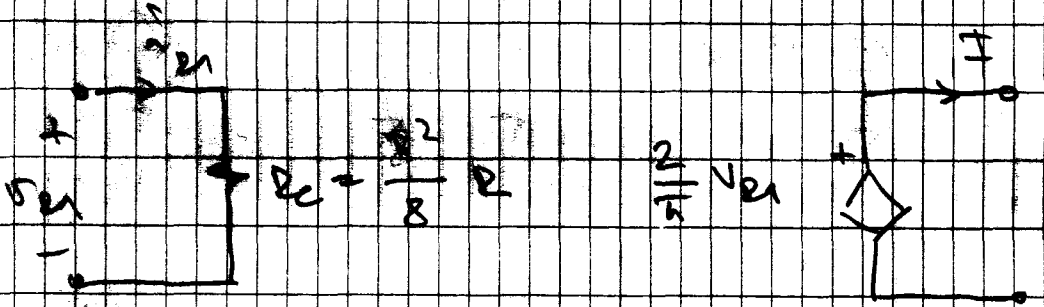
- volt-second balance on L_f

$$|v_{s1}| = \frac{2}{\pi} V_R = V \quad \Rightarrow \quad V_R = \frac{\pi}{2} V$$

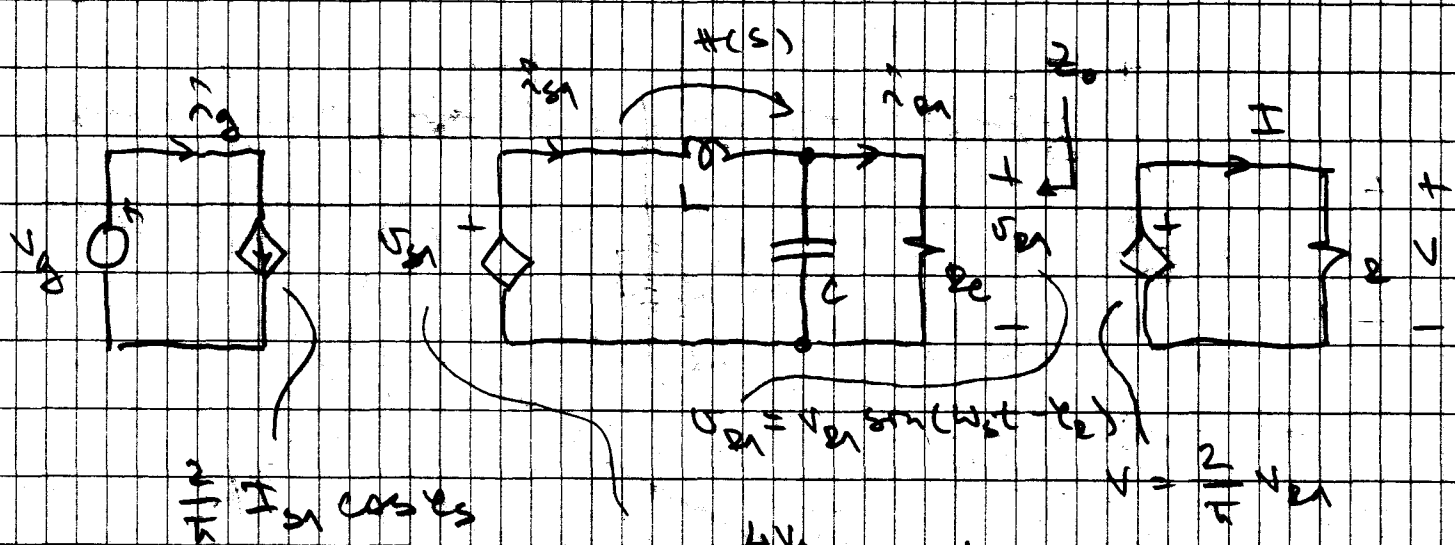
$$R_e = \frac{\pi}{4} \cdot \frac{\left(\frac{\pi}{2}\right)^2 V}{I} = \frac{\pi^2}{8} R$$

$$\boxed{R_e = \frac{\pi^2}{8} R}$$

- modelo interpolador, current-loaded



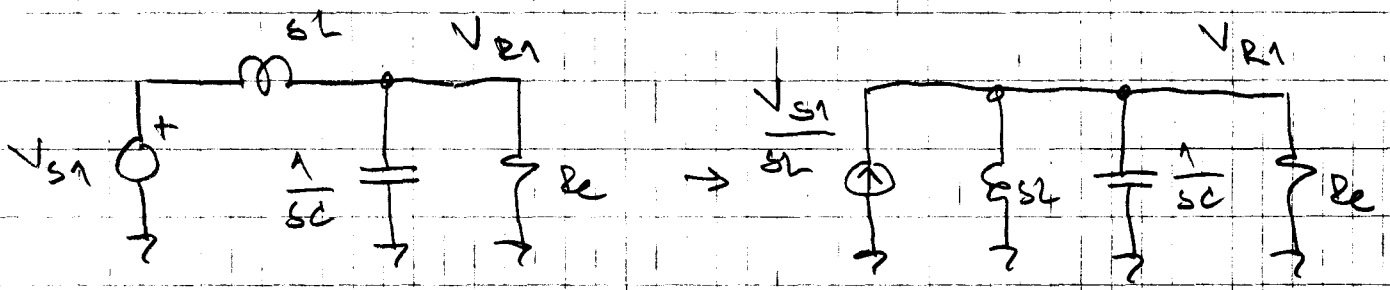
- equivalente com PRC



$$M = \frac{V}{V_g} = \frac{V}{V_{R1}} \cdot \frac{V_{R1}}{V_{S1}} \cdot \frac{V_{S1}}{V_g} =$$

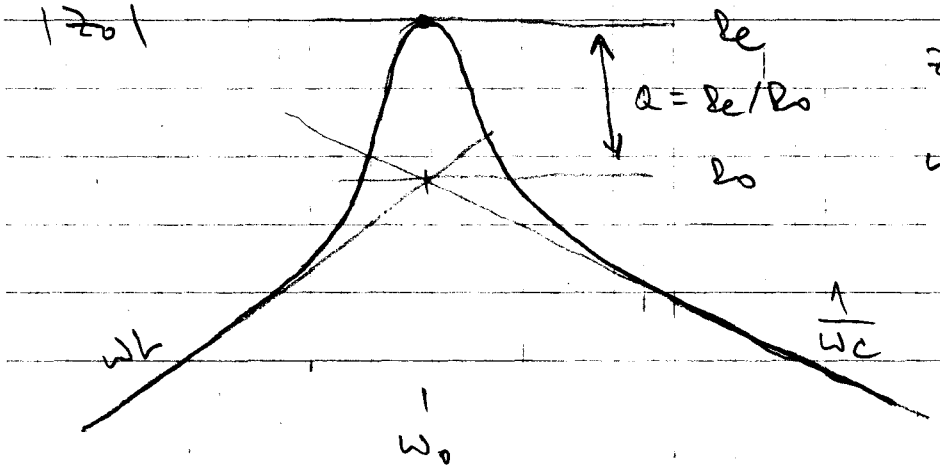
$$= \frac{2}{\pi} \cdot |H(j\omega_s)| \cdot \frac{4}{\pi}$$

$$\boxed{M = \frac{8}{\pi^2} |H(j\omega_s)|}$$



$$\frac{V_{R1}}{V_{S1}} = H(s) = \frac{Z_0}{sL}, \quad Z_0 = sL \parallel \frac{1}{sC} \parallel R_e$$

Bode plots, za dpsy opuszczamy



$$Z_0 = sL \parallel \frac{1}{sC} \parallel R_e$$

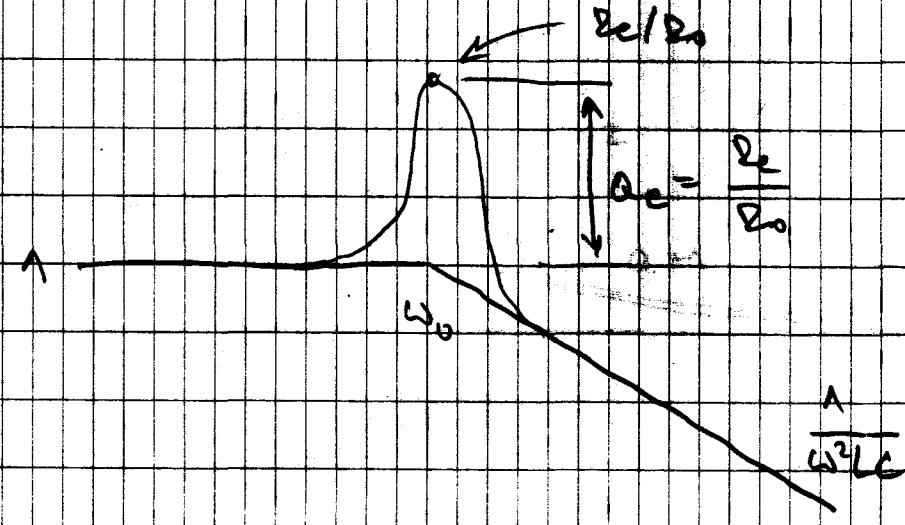
$\omega = \omega_0$:

$$\frac{1}{\omega_0 C} = \omega_0 L = R_0$$

$$\omega_0 = \frac{1}{\sqrt{LC}} \qquad R_0 = \sqrt{\frac{L}{C}}$$

$$Z_0(j\omega_0) = R_e$$

$$H(j\omega) = \frac{Z_0(j\omega)}{j\omega L}$$



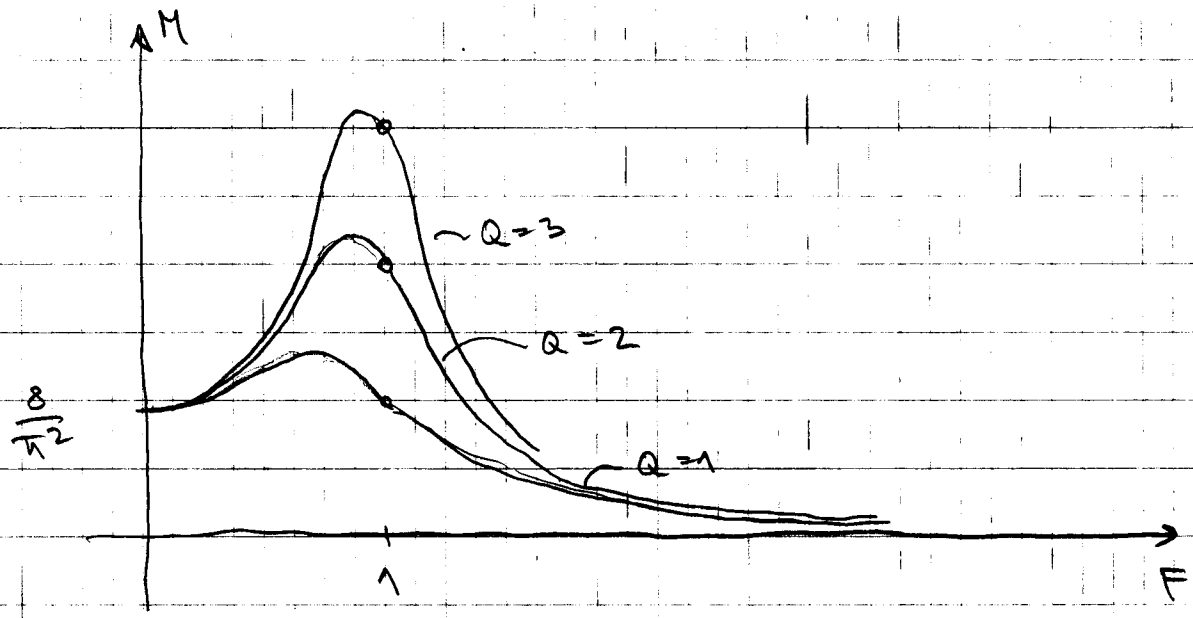
– отсюда, воспользовавшись тем фактом, что вблизи ω_0

$$M = \frac{\delta}{\pi^2} \left| \frac{1}{1 + \frac{\delta}{Q_e \omega_0} + \left(\frac{\delta}{\omega_0}\right)^2} \right|_{\delta = \frac{\pi F^2}{\delta}}$$

$$M = \frac{\delta}{\pi^2} \frac{1}{\sqrt{(1-F^2)^2 + \left(\frac{F}{Q_e}\right)^2}}$$ – кто "boost"

Сдвиг контура нагружения f_0, т. е. F

$$F = \frac{f_0}{f_0}$$ – нормализованная расстройка



Условия компенсирующего двигателя

– за два компенсатора

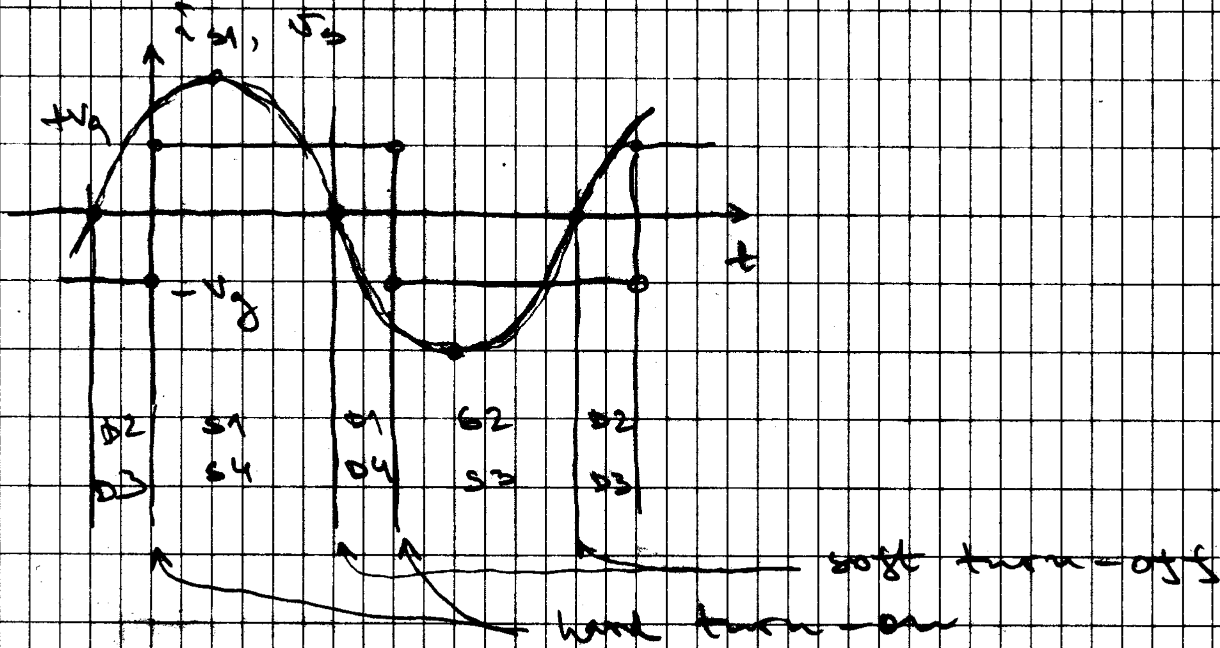
1) между резонансной частотой собственных двигателя (с демпфированием)

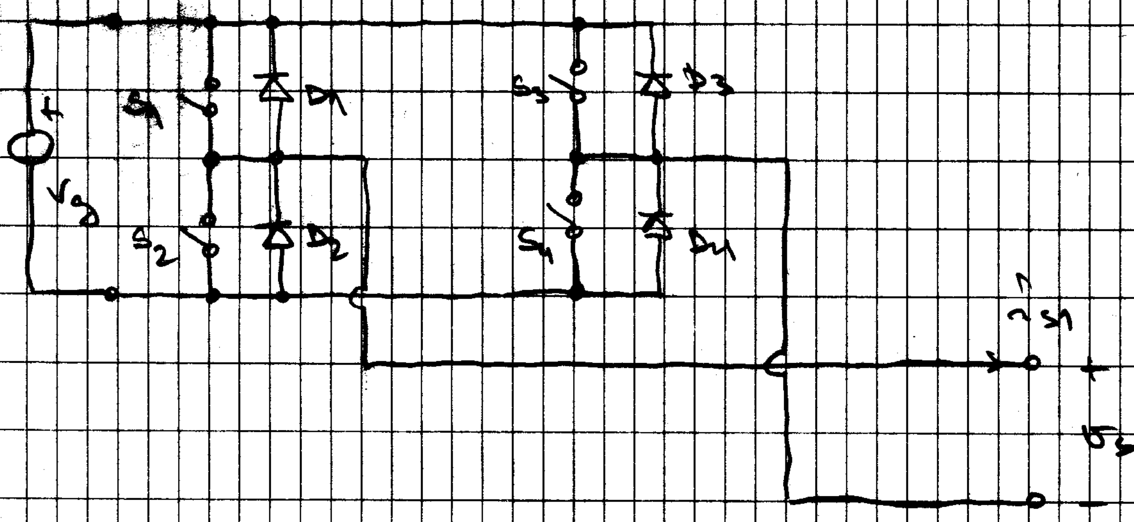
2) между резонансной частотой системы и L

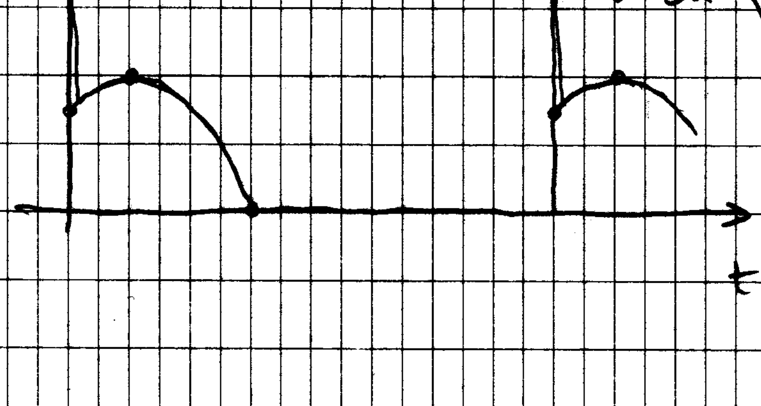
above / below resonance

lead / lagg

1) $f_s < f_0$, подрезонантни случај

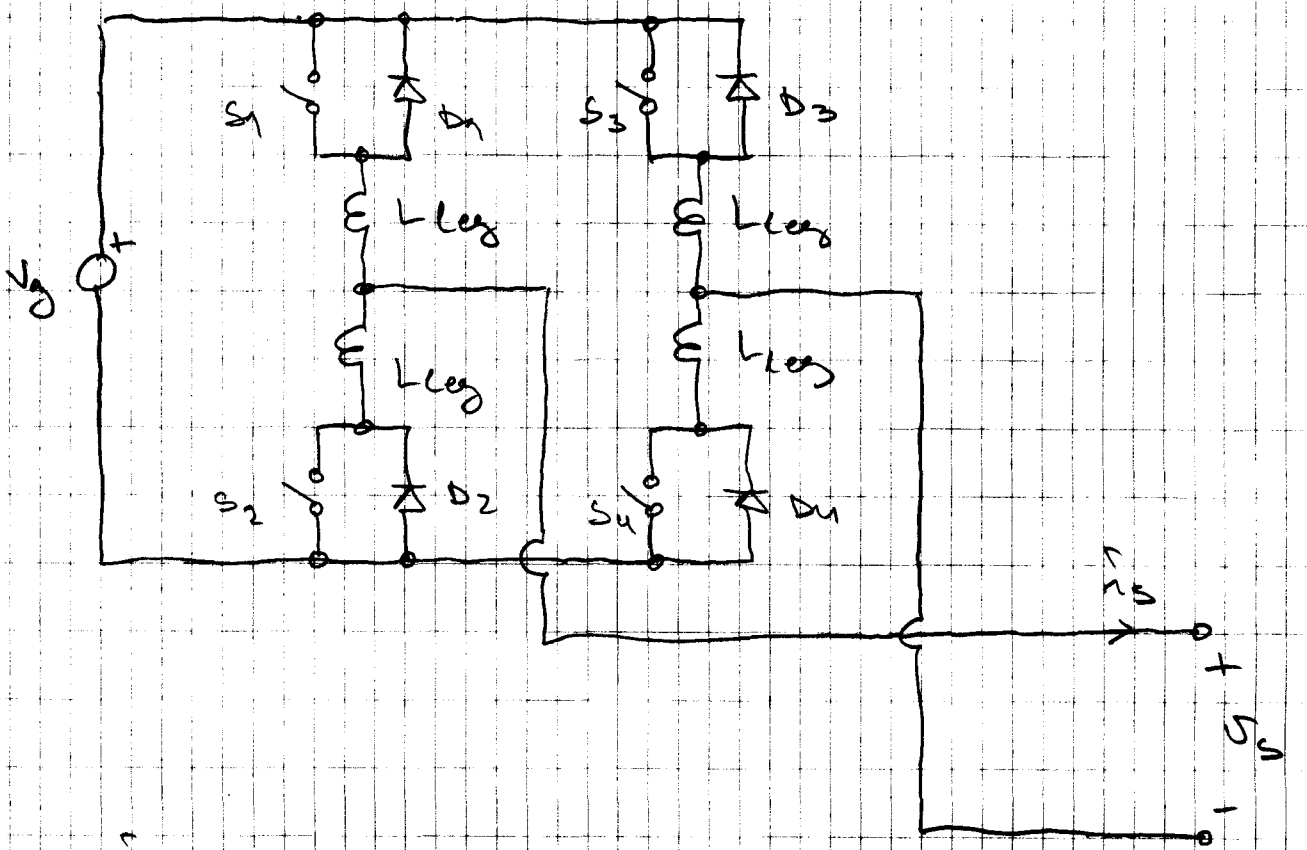


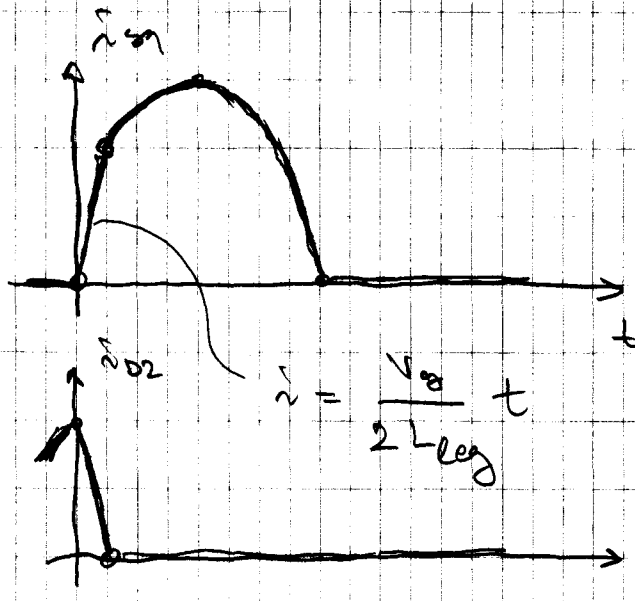




→ струјни удари због [illegible]
[illegible]
у D_2

– nie, nawet magnetycznego





$$i = \frac{V_g}{2L_{leg}}\, t$$

$$L_{ess} = L + 2L_{leg}$$

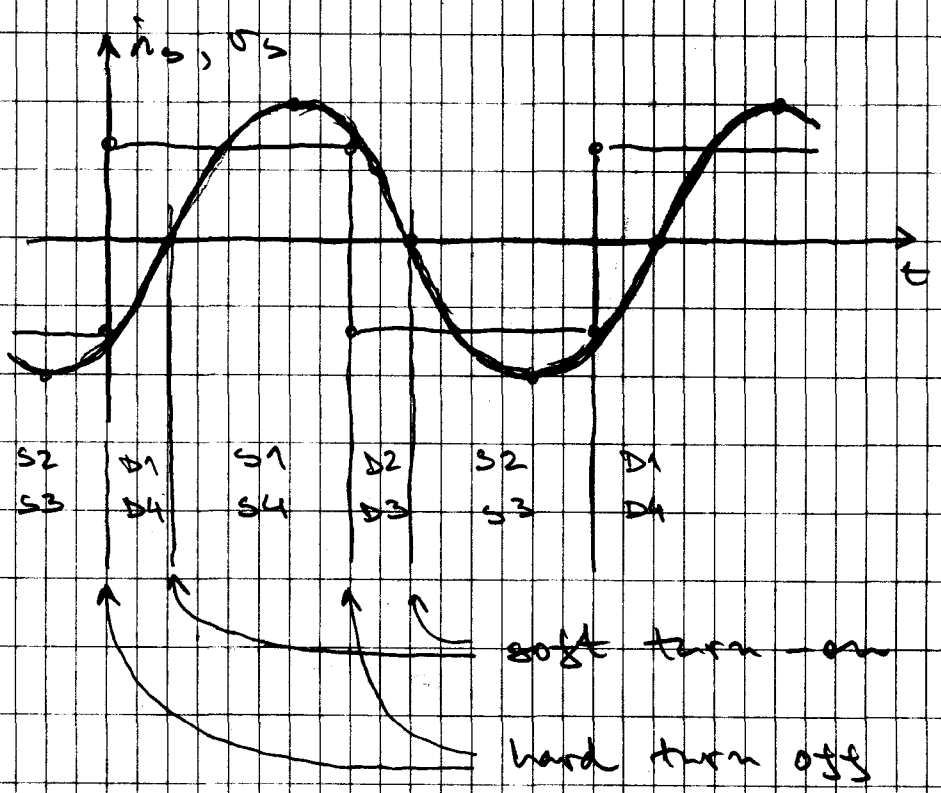
indukcyjność zastępcza

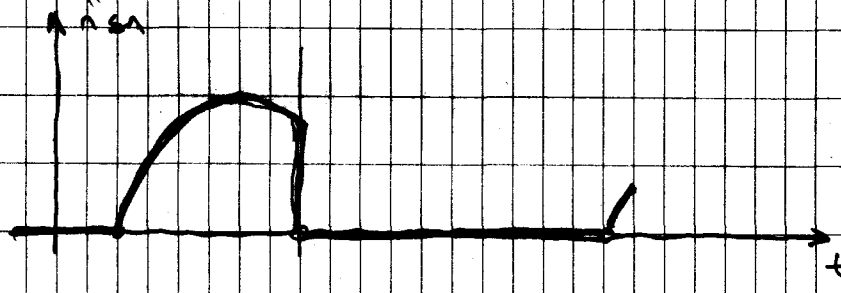
wyłączania

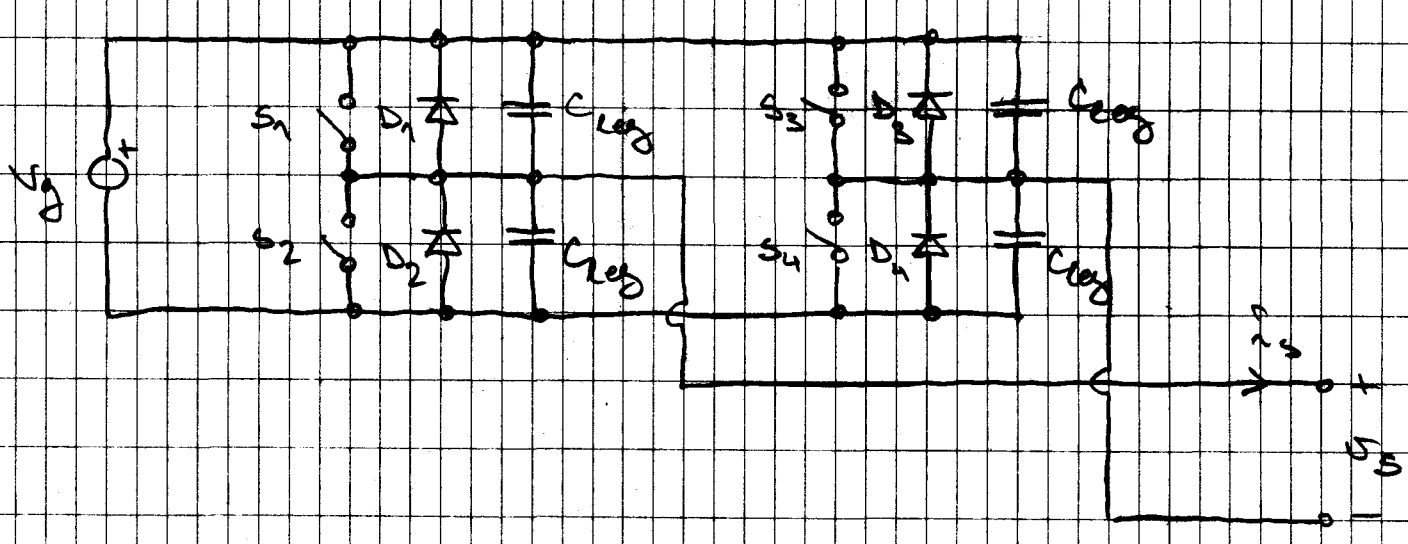
$$t_0 = \frac{2L_{leg}}{V_g} \cdot \hat{i}_s(0)$$

na ostatnią chwilę ze względu Leeg

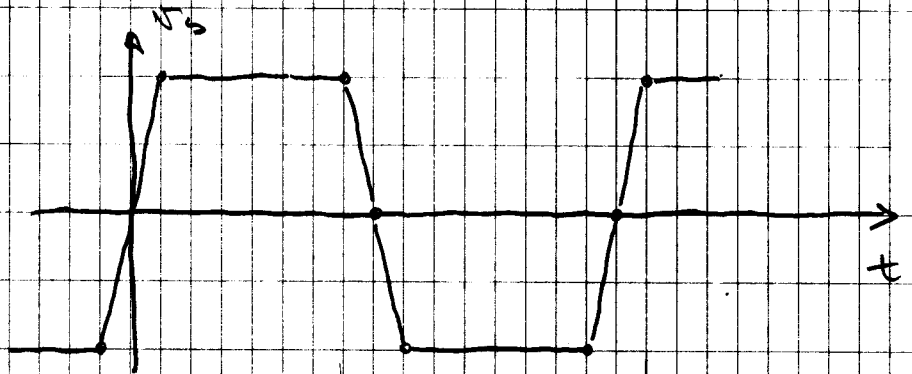
2). $f_s > f_0$, neljenavanje na ispravi







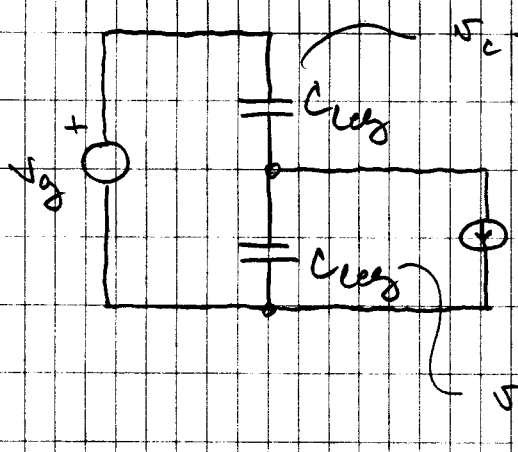
- Vaga ce iau S1 S2 de cate ori pe ce dam



S2		D1	S1		D2	S2		
S3	X	D4	S4	X	D3	S3	X	

$\rightarrow t_0 \leftarrow$ $\rightarrow t_0 \leftarrow$

Simplificare schema echivalenta



$$\frac{dv_c}{dt} = \frac{1}{C_{echiv}} \frac{1}{2} |\hat{i}_s(0)|$$

$$\frac{\Delta v_c}{\Delta t} = \frac{v_g}{t_0} = \frac{1}{2C_{echiv}} |\hat{i}_s(0)|$$

$$t_0 = \frac{2 C_{echiv} V_g}{|\hat{i}_s(0)|}$$