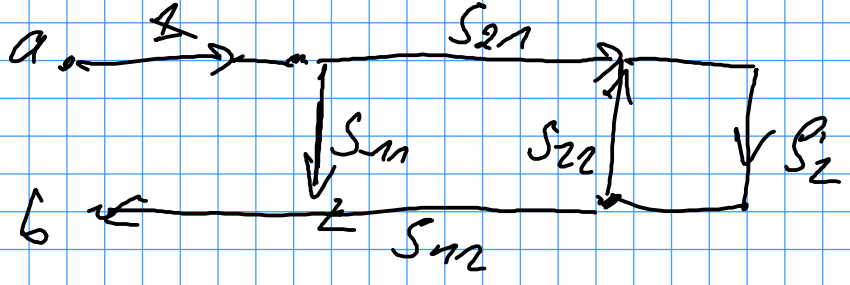
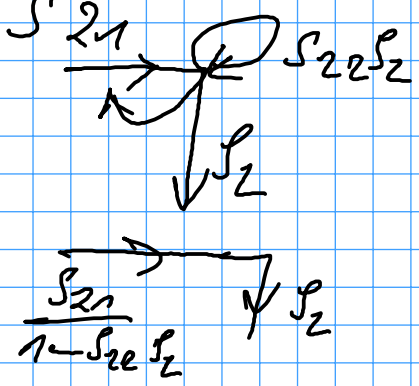
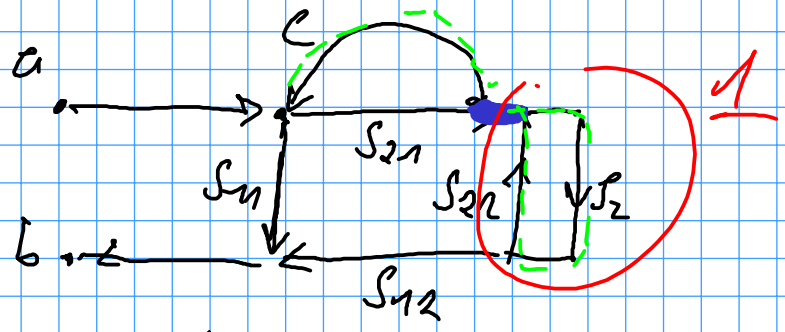
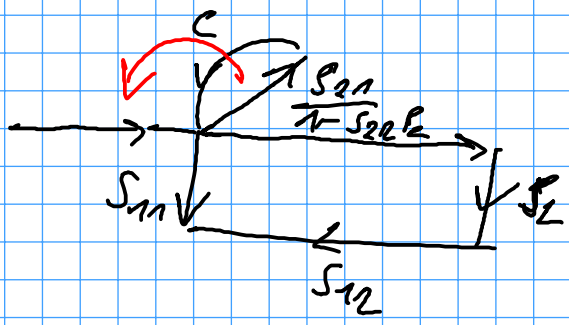


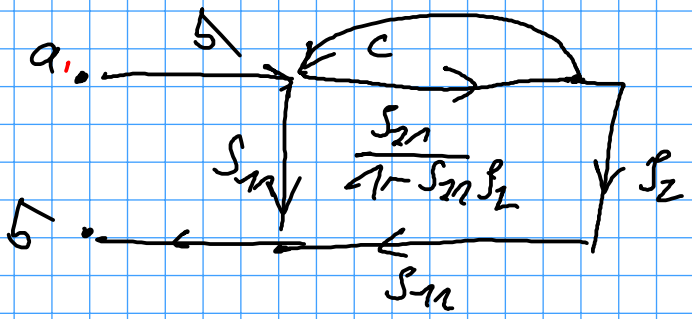


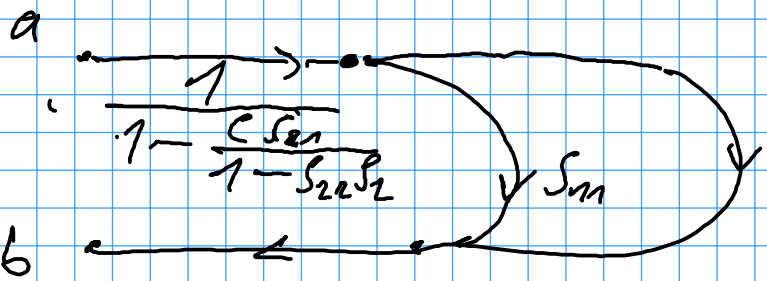
$$\frac{S_{21}S_L S_{12}}{1-S_{22}S_L}$$

$$\frac{b}{a} = S_{11} + \frac{S_{21}S_L S_{12}}{1-S_{22}S_L}$$









$$\frac{S_{21}S_L S_{12}}{1-S_{22}S_L}$$

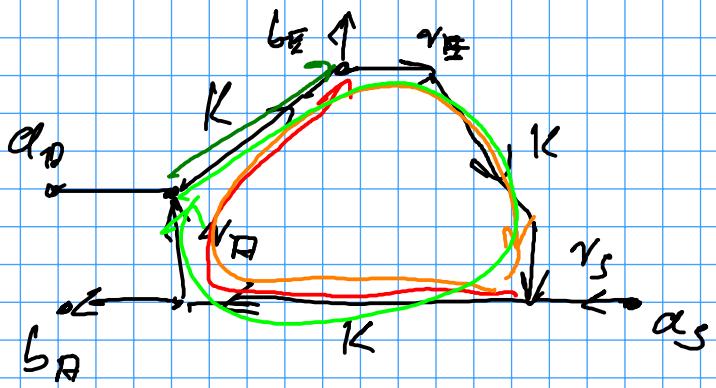
$$\frac{b}{a} = \frac{1}{1-S_{22}S_L-CS_{21}}\left(S_{11} + \frac{S_{21}S_L S_{12}}{1-S_{22}S_L}\right)$$

$= 0$

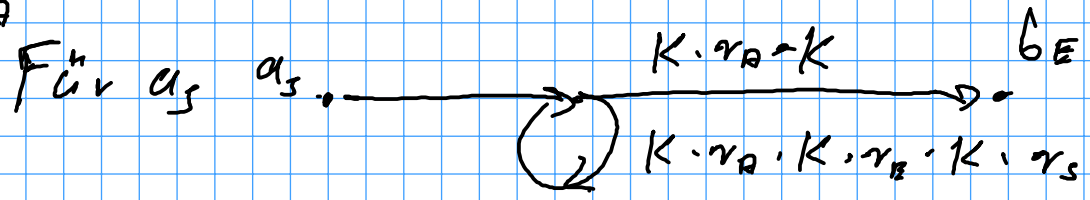
Für Kompensation $S_{21}S_L + CS_{21} = 0$

$$\Leftrightarrow \quad C = -\frac{S_{22}S_L}{S_{21}}$$

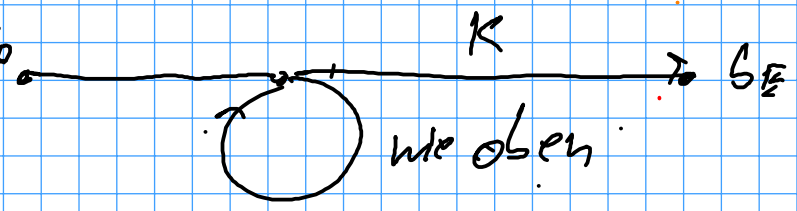
passiv realisierbar, weil $|C| < 1$ sehr wahrscheinlich!



Für a_S

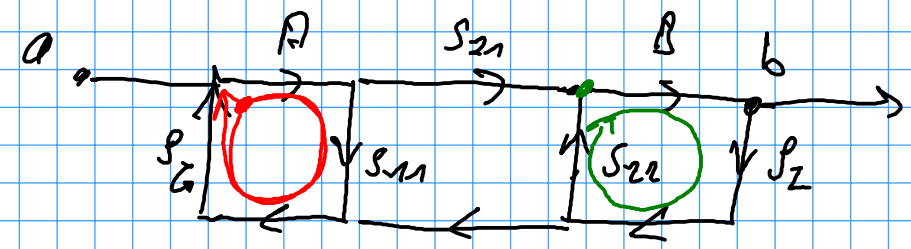


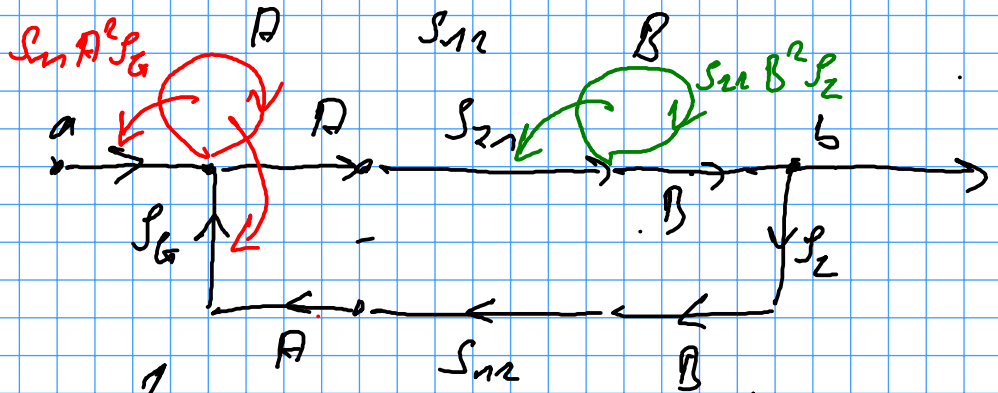
Für a_A

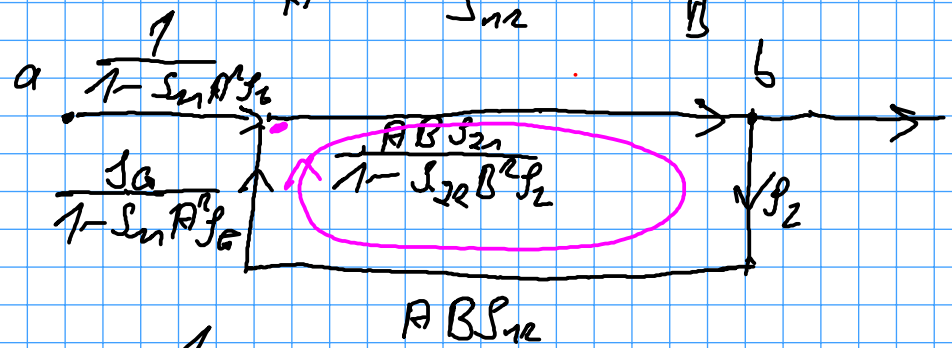


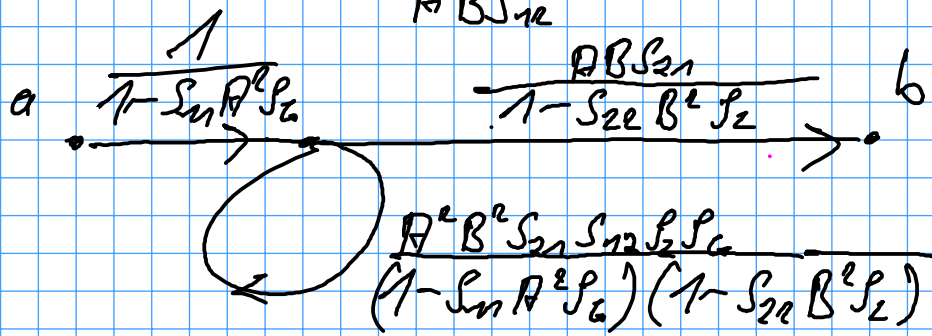
$$b_E = \frac{a_S K^2 r_A}{1 - K^3 r_A r_E r_S} + \frac{a_A \cdot K}{1 - K^3 r_A r_E r_S}$$

zu optimieren ist r_A, damit Sender & Empfänger möglichst gut entkoppelt sind. Der Unterschied zwischen den Pfaden $a_A \to b_E$ und $a_S \to b_E$ ist eben $K \cdot r_A$, K soll aber möglichst $|K| \to 1$ sein, also wenig Verlust im Filterfor.









$$\frac{b}{a} = \frac{\frac{ABS_{21}}{(1-S_{11}A^2S_G)(1-S_{22}B^2S_Z)}}{1-\frac{A^2B^2S_{21}S_{12}S_ZS_G}{(1-S_{11}A^2S_G)(1-S_{22}B^2S_Z)}}$$

$$= \frac{ABS_{21}}{(1-S_{11}A^2S_G)(1-S_{22}B^2S_Z) - A^2B^2S_{21}S_{12}S_ZS_G}$$

$$= \frac{ABS_{21}}{1-S_{11}A^2S_G-S_{22}B^2S_Z+S_{11}S_{22}A^2B^2S_ZS_G-A^2B^2S_{21}S_{12}S_ZS_G}$$

$\beta_2 = 0$ $\quad \frac{b}{a} = \frac{A B S_{21}}{1 - S_{11} A^2 \beta_G}$

$$S_{21} = \frac{b}{a} \cdot \frac{1 - S_{11} A^2 \beta_G}{A B}$$

$|S_{11}| \to \pm 1 \qquad A = B = 1$

$$S_{21} = \frac{b}{a} \cdot (1 \pm 1 \cdot \beta_G)$$

$|\beta_G| = 0,316 \; ; \; 0,1$

$|\beta_G| = 0,316 \Rightarrow \quad 0,684 \frac{b}{a} \leq S_{21} \leq 1,316 \frac{b}{a}$

$|\beta_G| = 0,01 \Rightarrow \quad 0,9 \frac{b}{a} \leq S_{21} \leq 1,1 \frac{b}{a}$