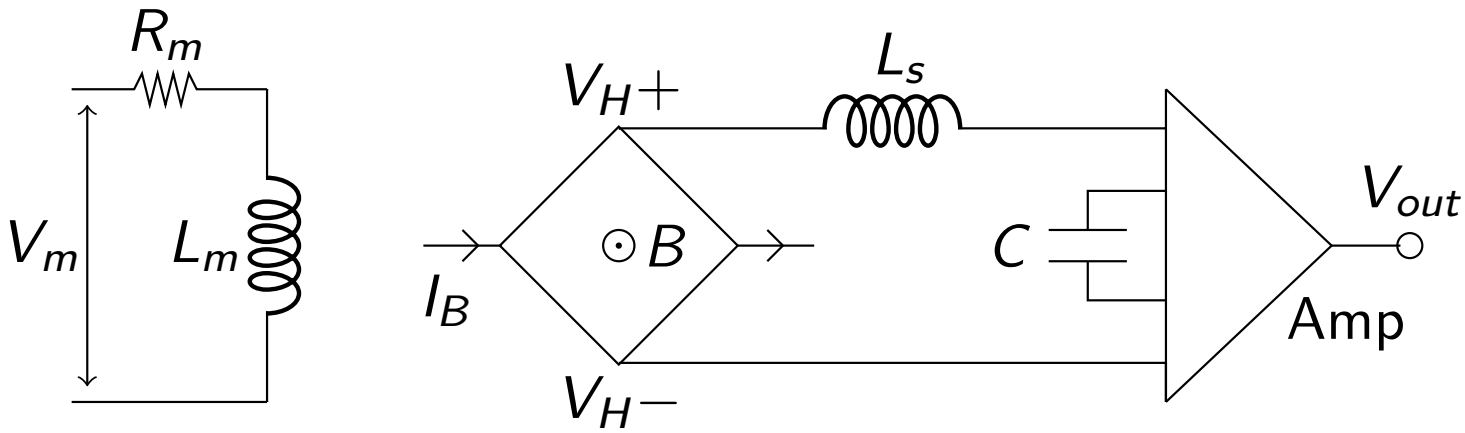
Model of the System



$$|V_{out}| = \frac{1000\mu_0 NR^2 V_m \sqrt{g^2 R_H^2 I_B^2 + L_s^2\omega^2}}{\sqrt{2}(z^2+R^2)^{3/2}\sqrt{R_m^2+\omega^2 L_m^2}\sqrt{1+(6000\omega C)^2}}$$

$$\phi = -\arctan\left(\frac{L_s}{gR_H I_B}\omega\right) - \arctan\left(\frac{L_m}{R_m}\omega\right) - \arctan\left(6000\omega C\right)$$