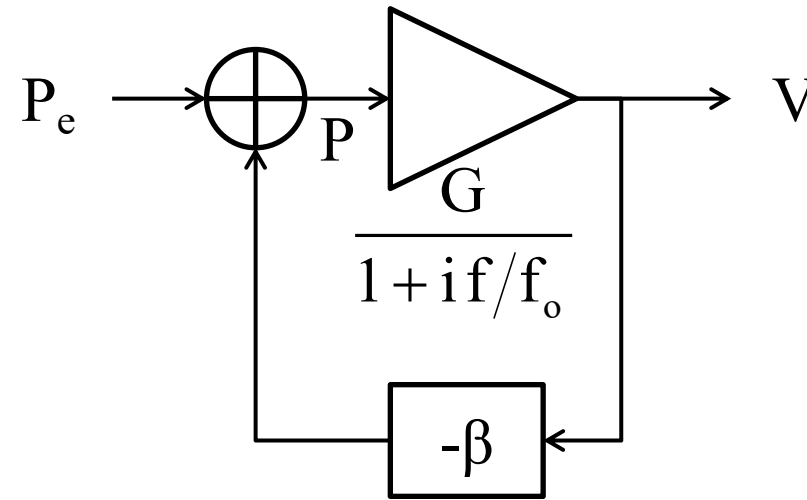


Exercise 3

- A system consists of a pressure transducer, converting a pressure signal P into a voltage one V , with an operating range of ± 1 Pa. Within this operating range, the transducer behaves like a simple low pass, with a gain of $G=100$ V/Pa, and a roll-off frequency of $f_o=10$ Hz.
- To operate the transducer, a feedback loop sends back its output to a piezoelectric crystal, able to exert a pressure $P_{fb} = -\beta V$ on the transducer, with $\beta=1$ Pa/V.



- Calculate:
 - The transfer function $P_e \rightarrow V$ of the closed loop system.
 - The maximum peak value allowed for a sinusoidal external pressure signal, in order to stay within 10% of saturation. Give the answer as a function of frequency.