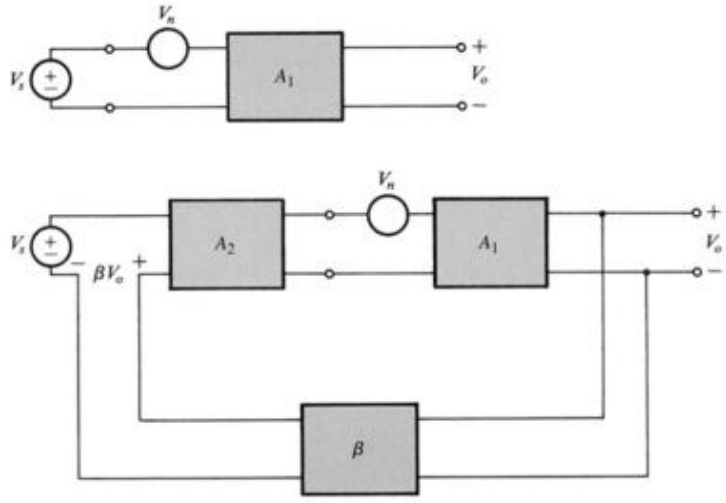
Interference reduction

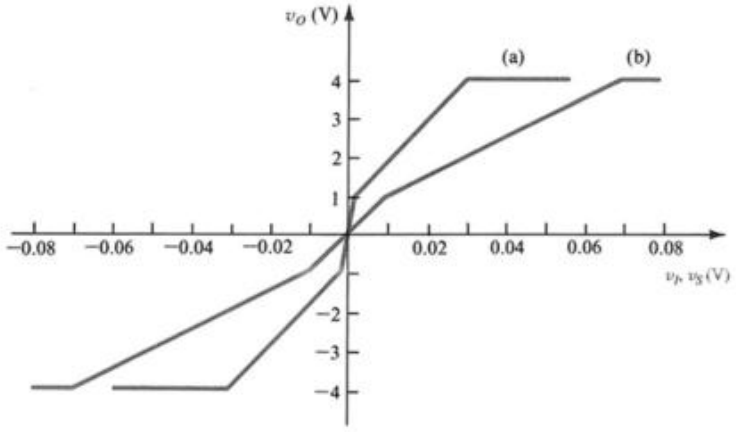
- The signal-to-noise ratio:
  - The amplifier suffers from interference introduced at the input of the amplifier
  - Signal-to-noise ratio: $S/I = V_s/V_n$
- Enhancement of the signal-to-noise ratio:
  - Precede the original amplifier A_1 by a clean amplifier A_2
  - Use negative feedback to keep the overall gain constant

$$V_0 = V_s \frac{A_1 A_2}{1 + A_1 A_2 \beta} + V_n \frac{A_1}{1 + A_1 A_2 \beta} \rightarrow \frac{S}{I} = \frac{V_s}{V_n} A_2$$



Reduction in nonlinear distortion

- The amplifier transfer characteristic is linearized through the application of negative feedback



➔ $\beta = 0.01$

➔ A changes from 1000 to 100

$$A_{f1} = \frac{1000}{1+1000\times 0.01} = 90.9$$

$$A_{f2} = \frac{100}{1+100\times 0.01} = 50$$