Structured Electronic Design

Reduction of biasing errors

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Reduction of biasing errors

Error reduction techniques:

- 1. Compensation of reproducible errors
 - Errors caused by bias currents of of operational amplifiers
- 2. Negative feedback
 - Separate feedback networks for AC and DC
 - Can only be applied if frequency range of temperature changes differs from signal frequency range
- 3. Auto-zero
 - Compensate bias errors during a time interval that the signal is not of interest
 - Store and use this compensation during the time that the signal is of interest
 - Use two auto-zero amplifiers and swich between them
- 4. Modulation and demodulation (chopper amplifier)
 - Change the frequency range of the signal before amplification
 - Separate frequency range of temperature changes from signal frequency range

Negative feedback biasing



Low offset voltage Low bias current Low offset current

SLiCAP negative feedback biasing

Feedback biasing

The DC voltage V_{outDC} is:

 $V_{\rm outDC} = 1.0 V_{\rm ref}$

The voltage transfer A_v from source to load is:



For high frequencies, this transfer can be written as:

$$A_v = 20.0$$



(2)

 $(\mathbf{3})$