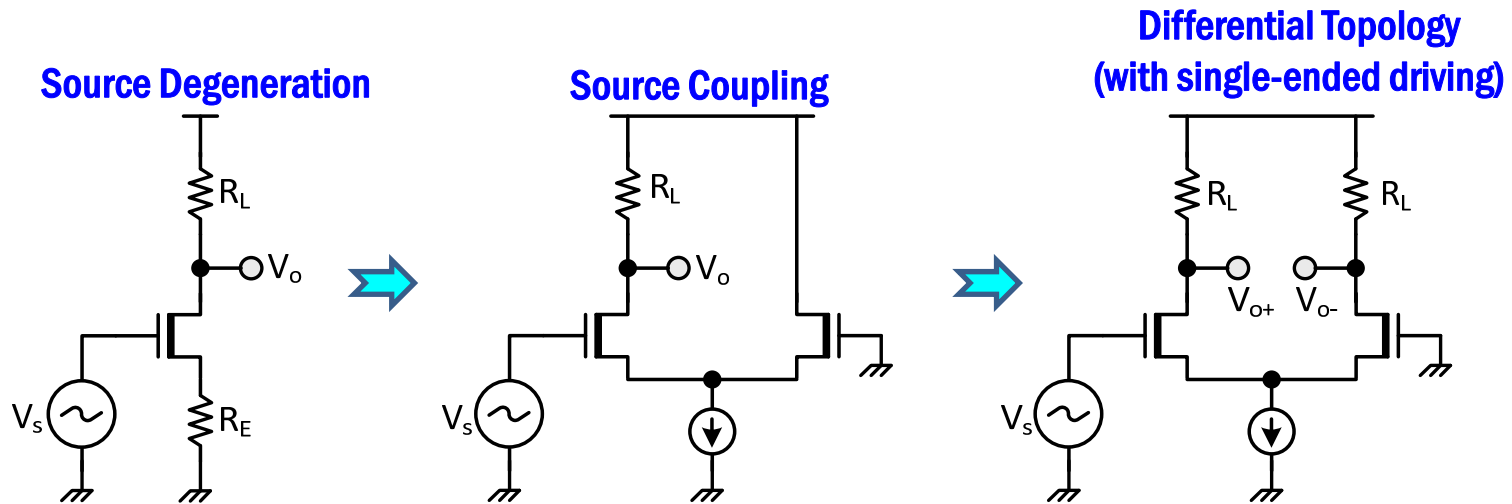


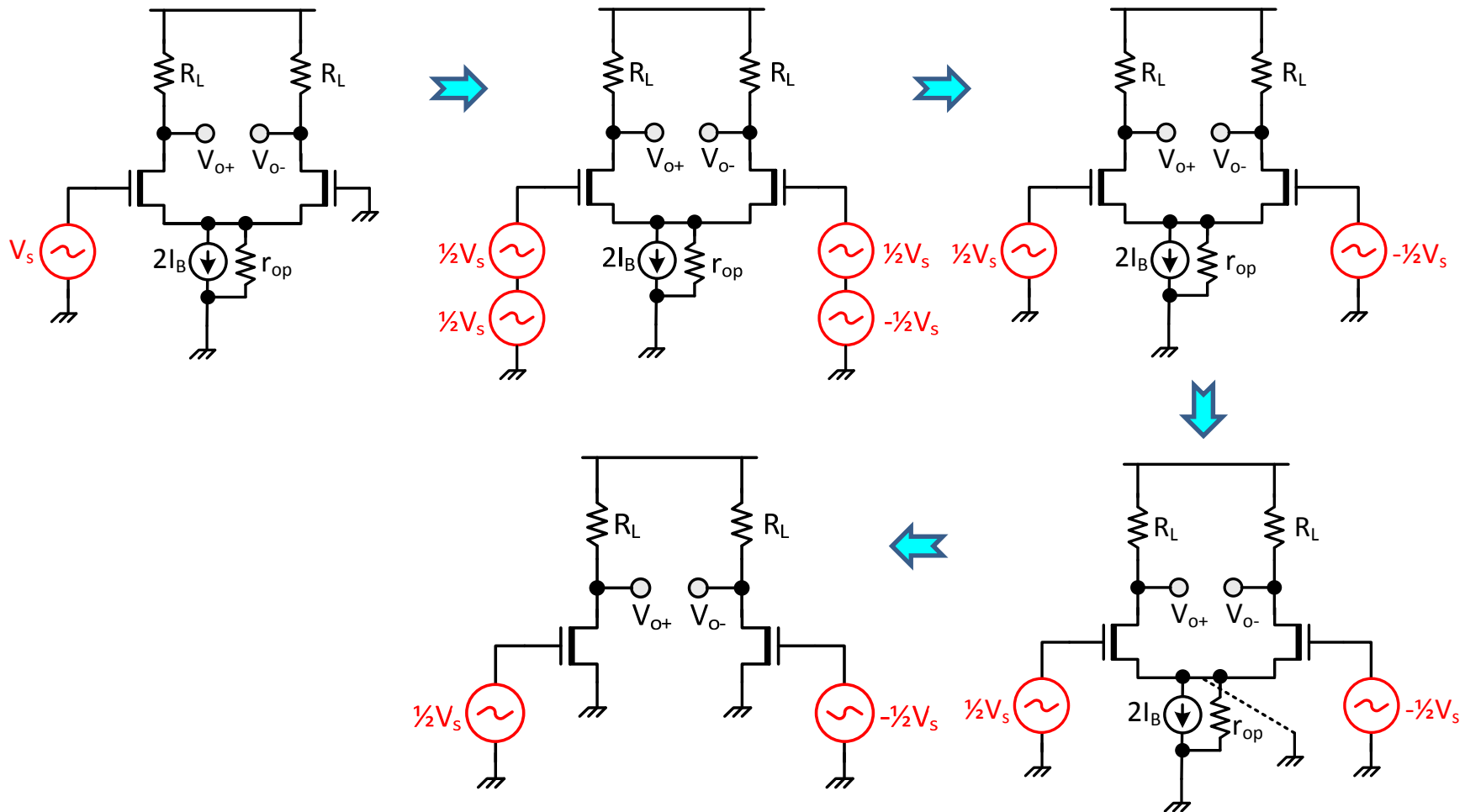
Source Coupling

□ What's the benefit of differential topology ?



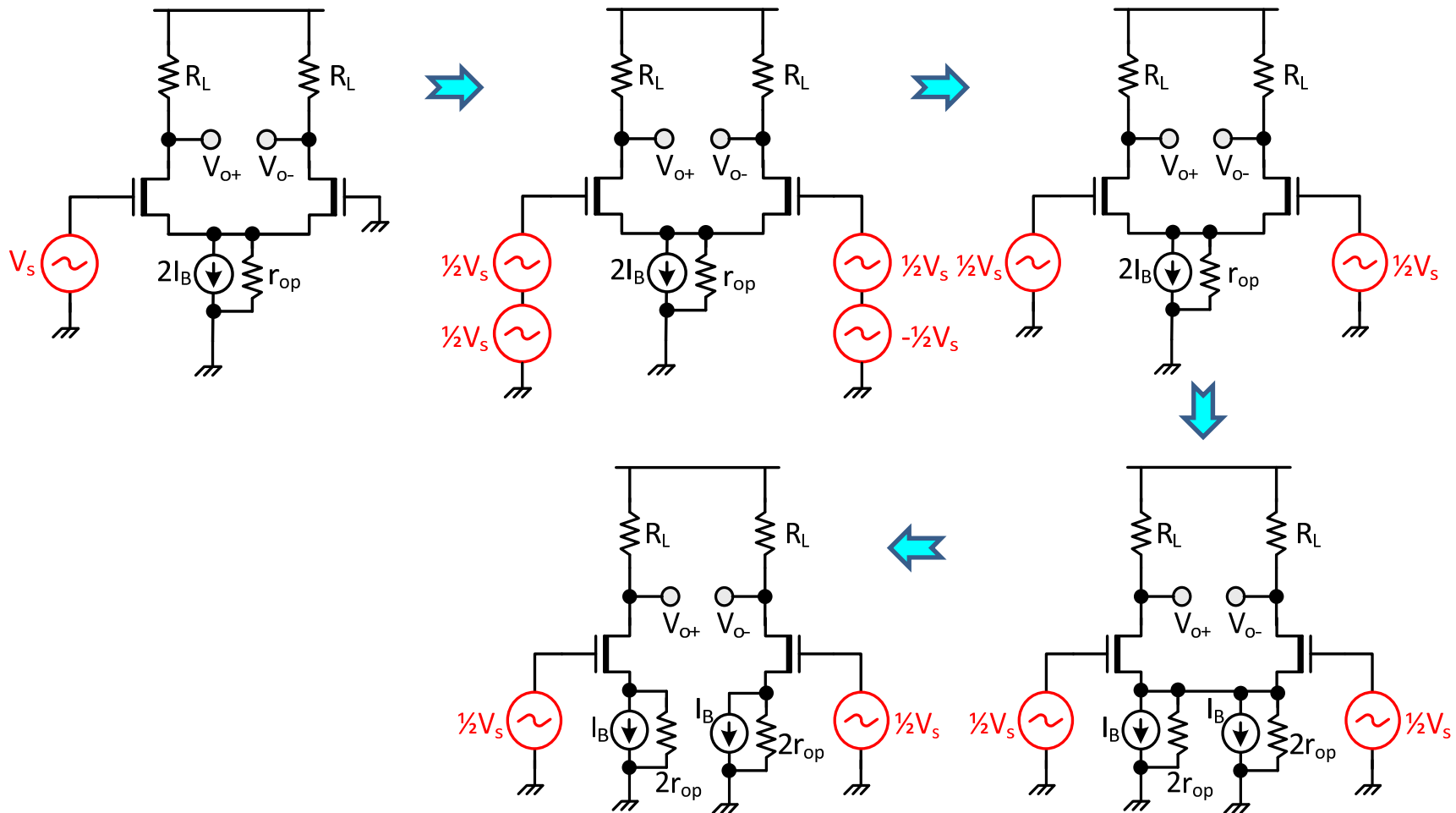
Single-Ended vs. Differential Driving

□ Topological equivalence in terms of **differential-mode driving**



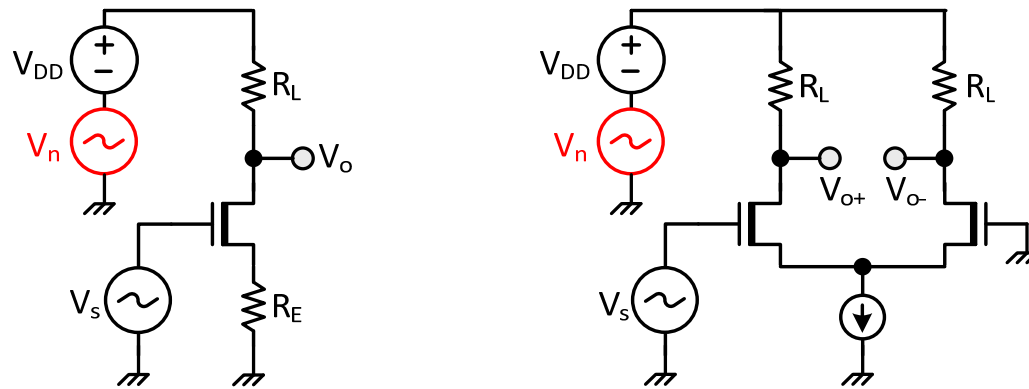
Single-Ended vs. Differential Driving

□ Topological equivalence in terms of **common-mode driving**



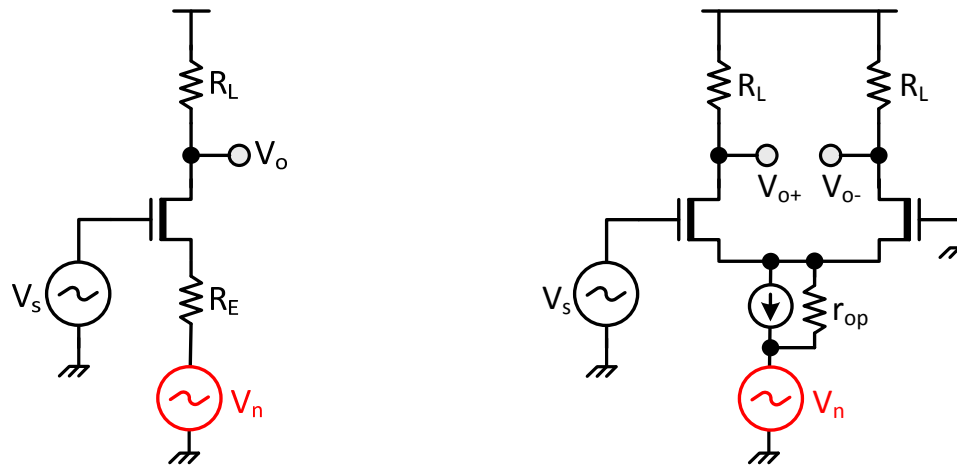
Power Supply Noise Rejection

□ What's the benefit of differential topology ?



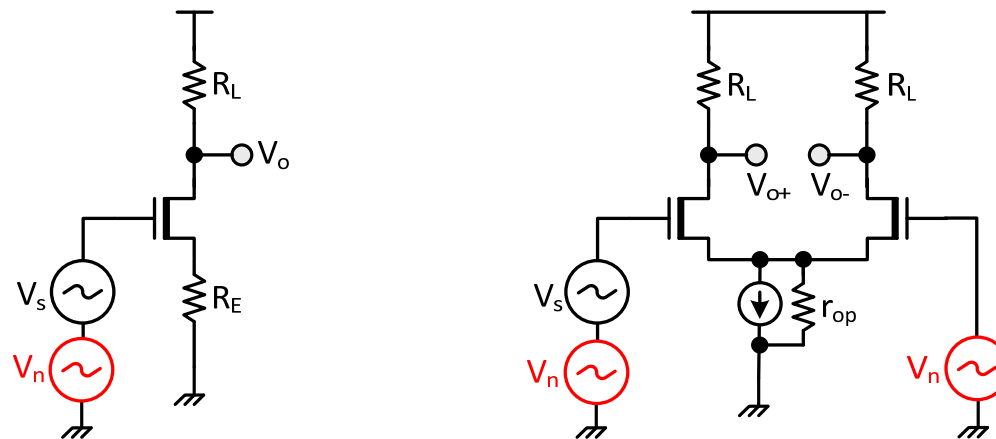
Ground Noise Rejection

□ What's the benefit of differential topology ?



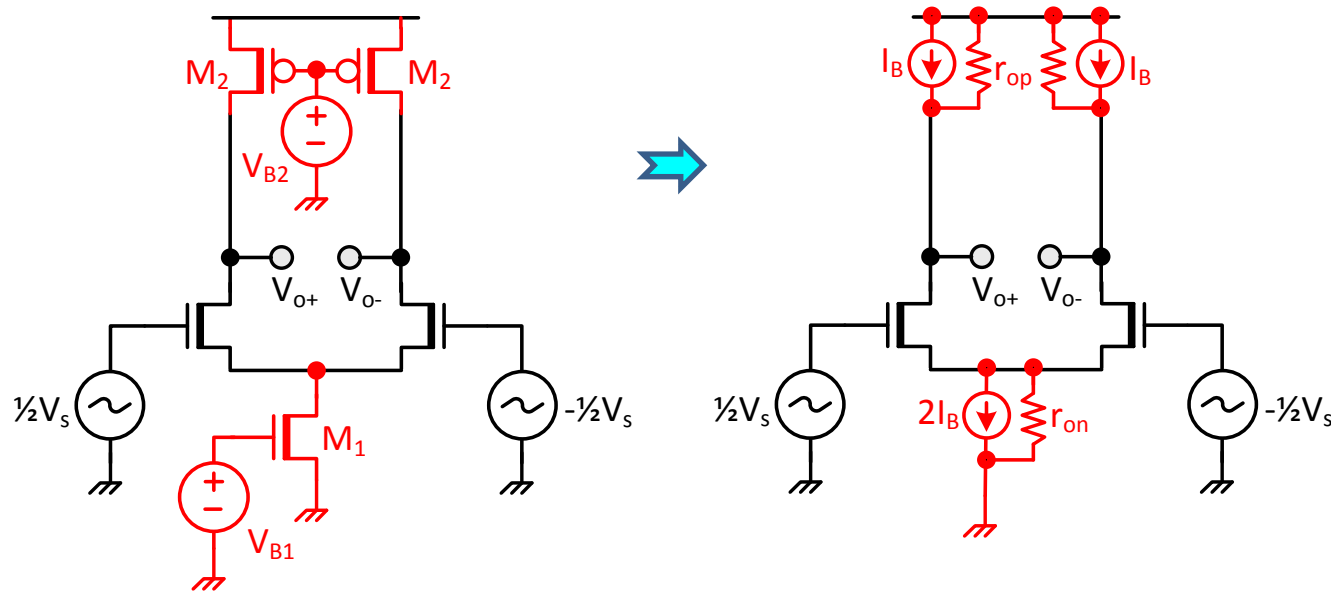
Common-Mode Noise Rejection

□ What's the benefit of differential topology ?



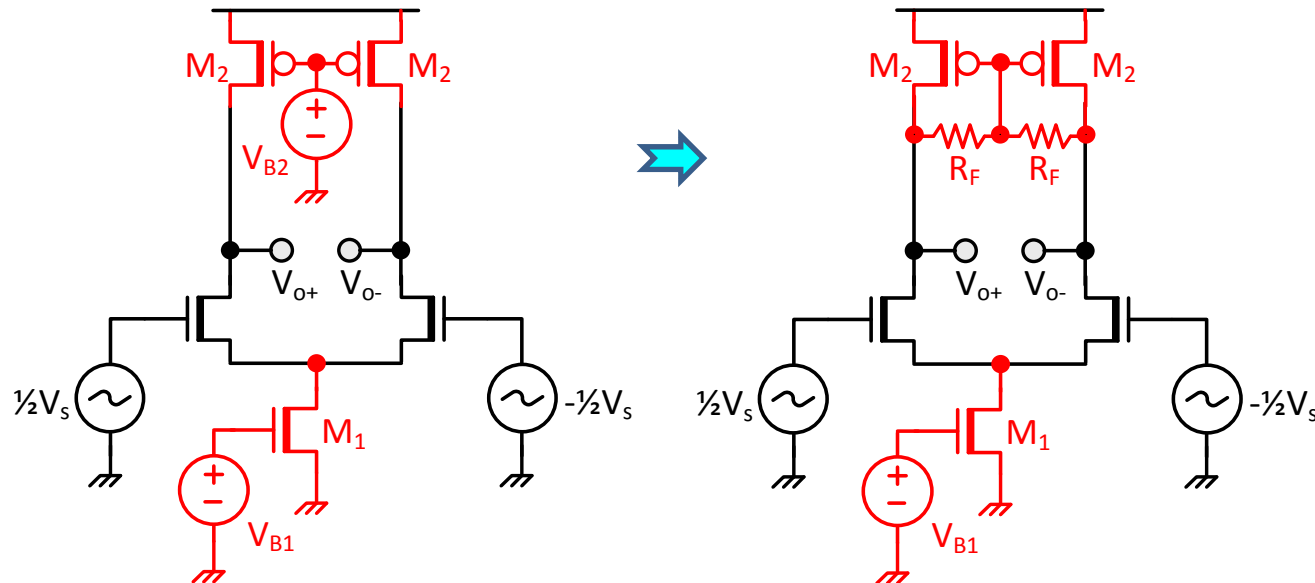
DC Stability (1)

□ What if NMOS and PMOS bias currents are not matched ?



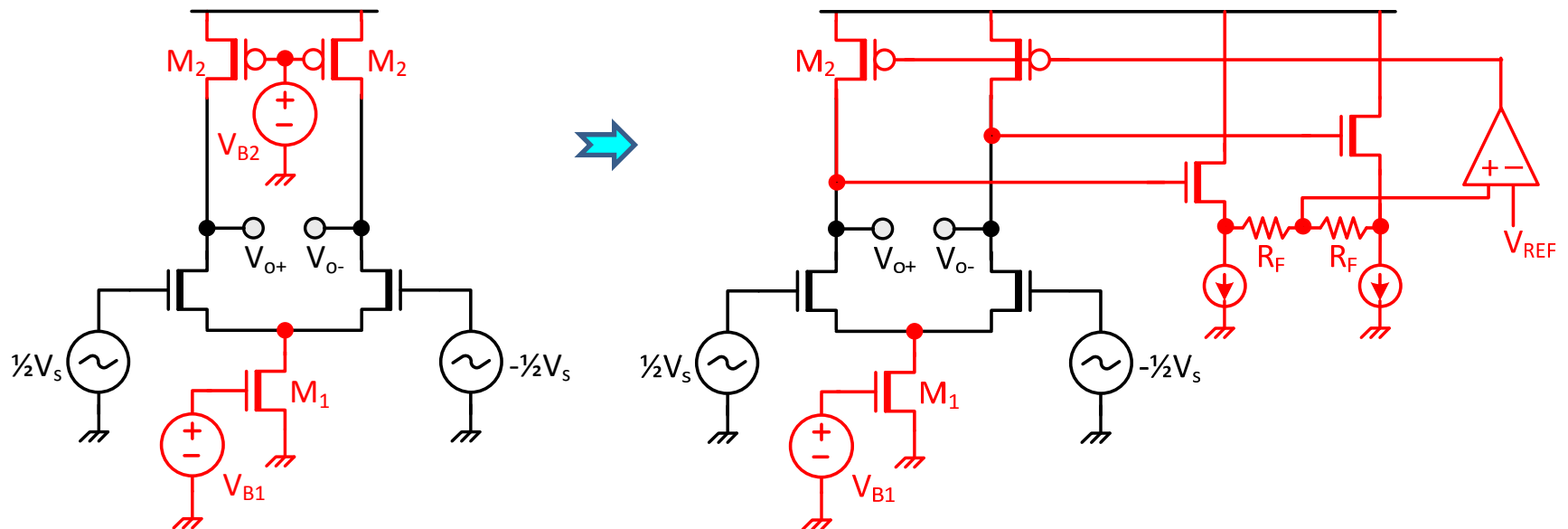
DC Stability (2)

- ❑ Common-mode DC feedback \Rightarrow **common-mode feedback load**
- ❑ What could be an issue in this common-mode feedback load?



DC Stability (3)

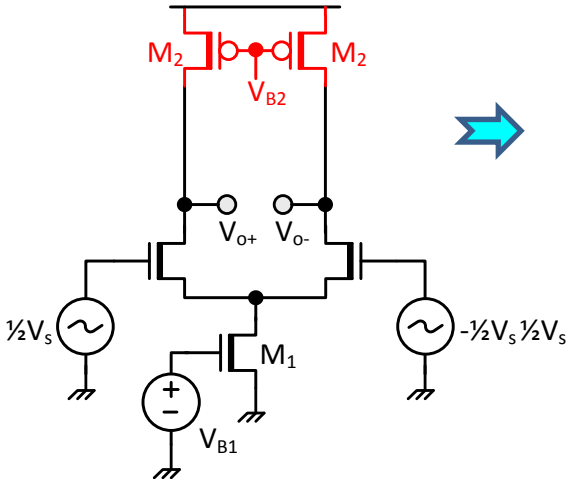
- Apply **buffering** first, then common-mode DC feedback (why?)



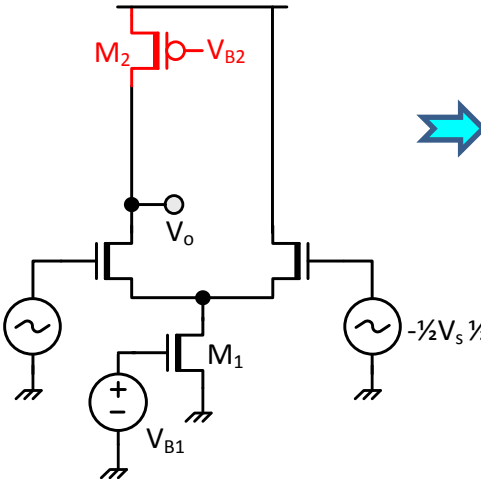
Active Loading

□ These topologies are for single-ended output.

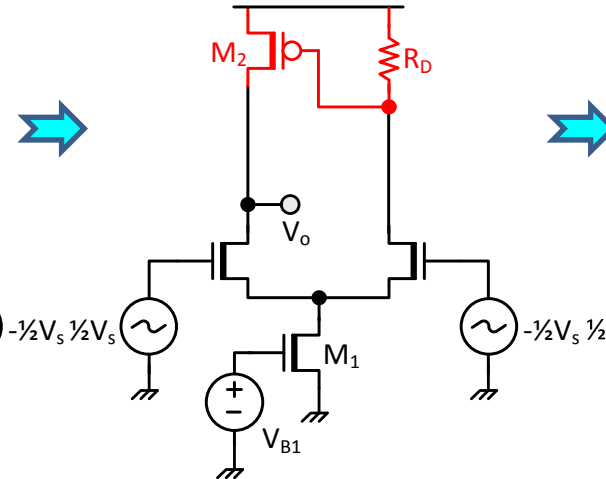
Differential output
(passive loading)



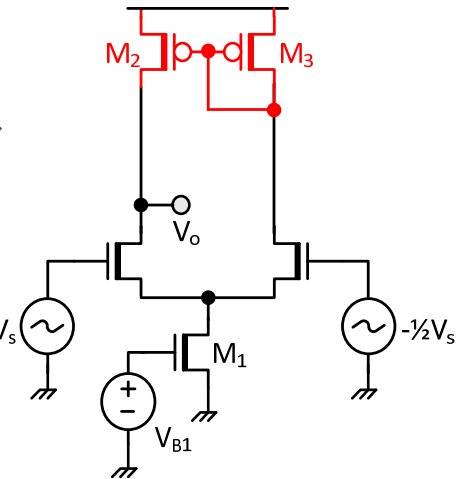
Single-ended output
(passive loading)



Single-ended with active-loading
(by resistor sensing)



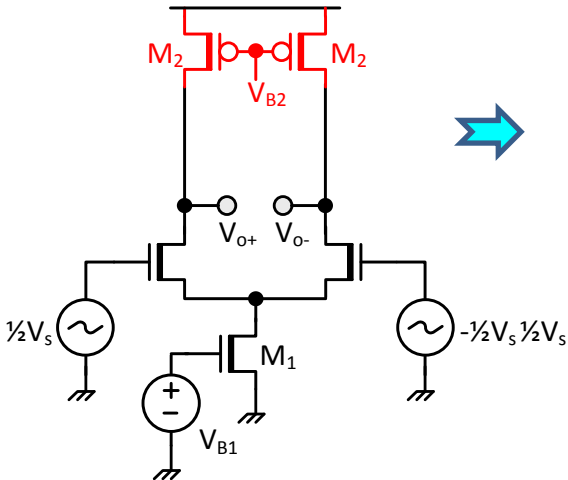
Single-ended with active-loading
(by mirroring)



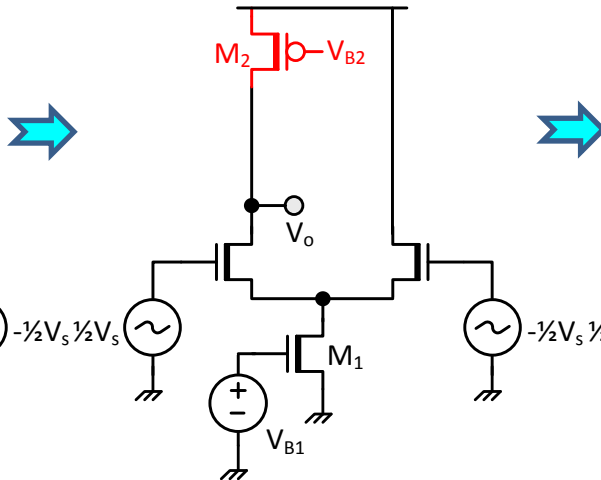
Active Loading

□ These topologies are for single-ended output.

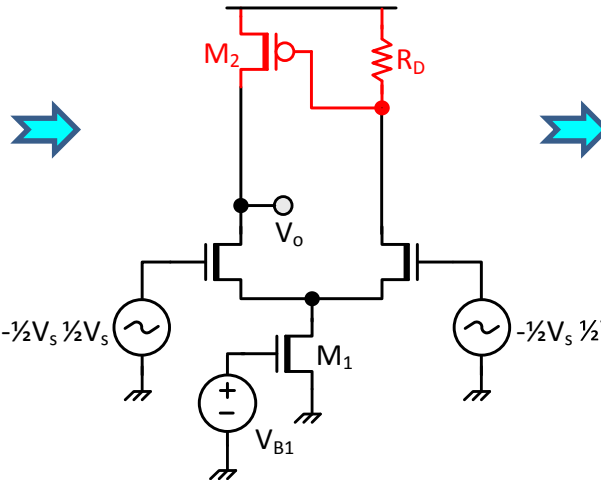
Differential output
(passive loading)



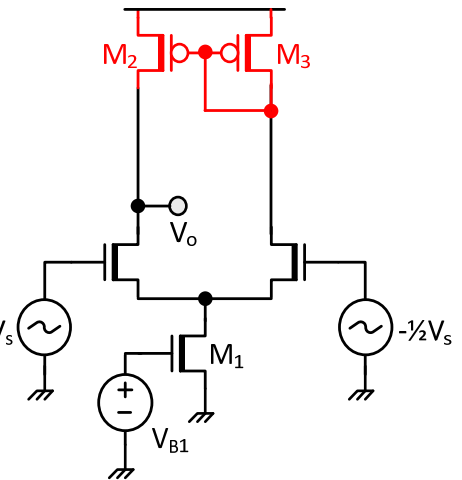
Single-ended output
(passive loading)



Single-ended with active-loading
(by resistor sensing)



Single-ended with active-loading
(by mirroring)



Some Comments On Applying Virtual Grounding

□ When can we apply virtual grounding in differential topologies (and when can't)?

