Elick D'Rozario
ENEE 408D

Goal of the Project

- Simulate and perform layout of an operational transconductance amplifier.
- Note: Read the classic neural amplifier paper to understand the process of designing an amplifier.
- Schematic of the OTA is shown below.

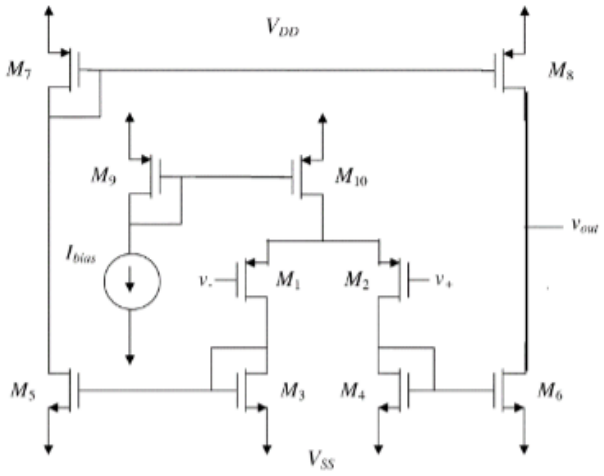

Figure 1. Schematic of an OTA.

- Using the widths and lengths given in the table below, you will find the… (*using AC analysis*) for both schematic and layout. For frequency = 1k Hz…
  - Open loop gain (dB) = -337.6 dB
  - F-3db frequency (Hz) = 14.19 Hz
  - Unity gain frequency (Hz) = 0 Hz

Transistors	W/L (um) 2.8575	W/L (lamda)
M1, M2	200/4	572/11
M3, M4, M5, M6	12/4	34/11
M7, M8, M9, M10	24/4	69/11
Ibias	8 uA	

- Overall area = ((228*277.5)+(30*234))/(2.8575)^2 = 8608.4 um^2
- Overall power consumption = 6.15 * 10^-5 W

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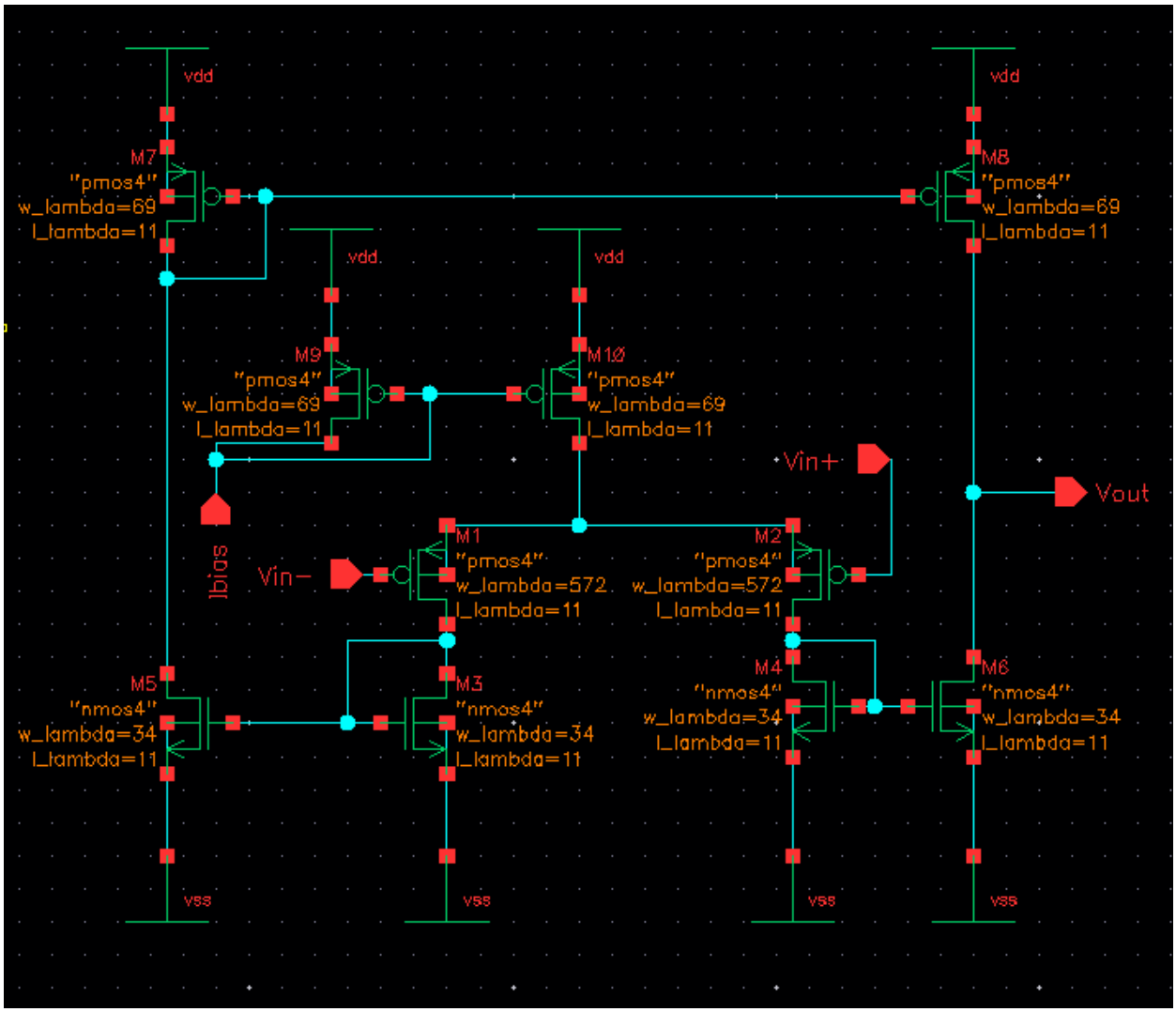
Schematic



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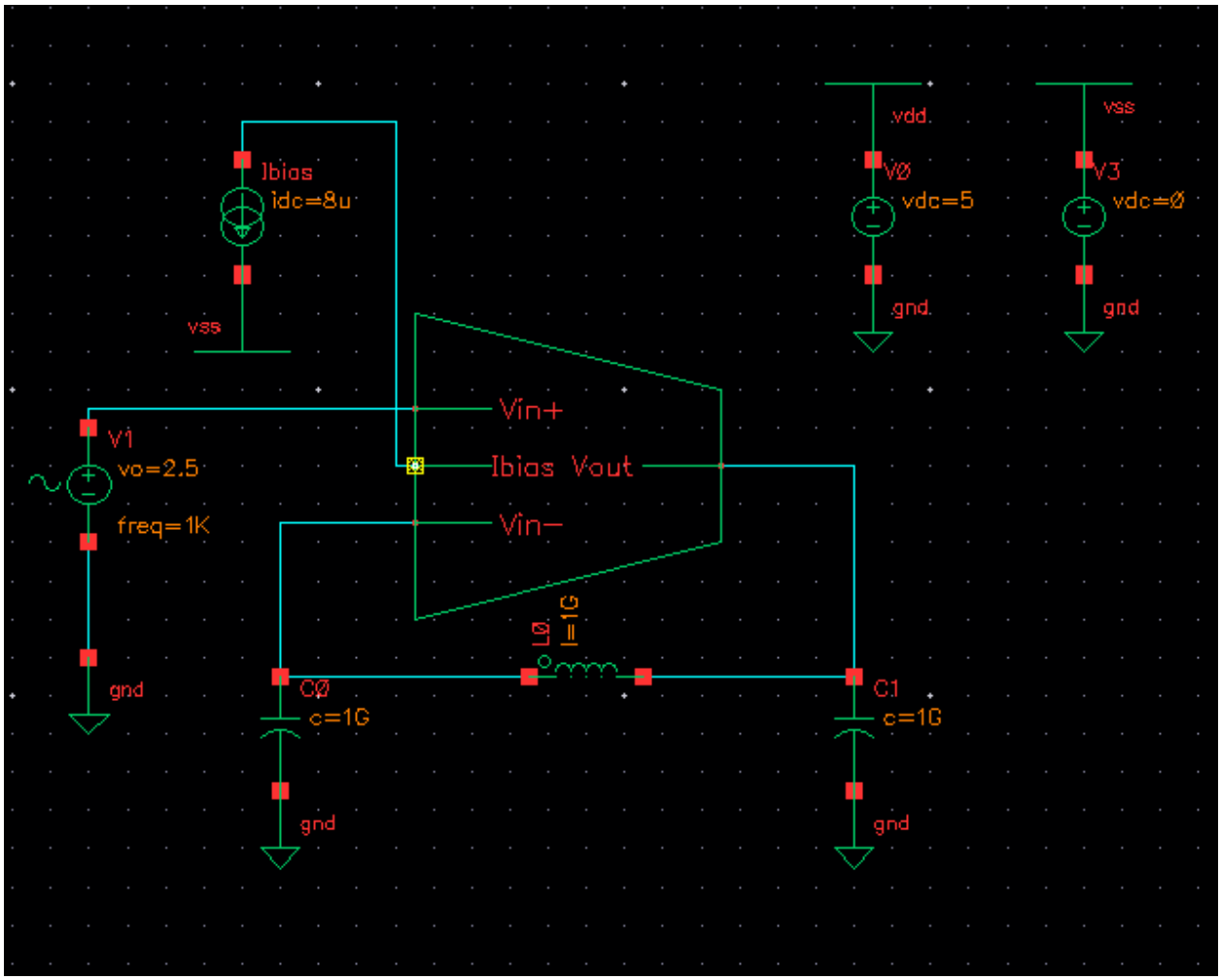
Testbench



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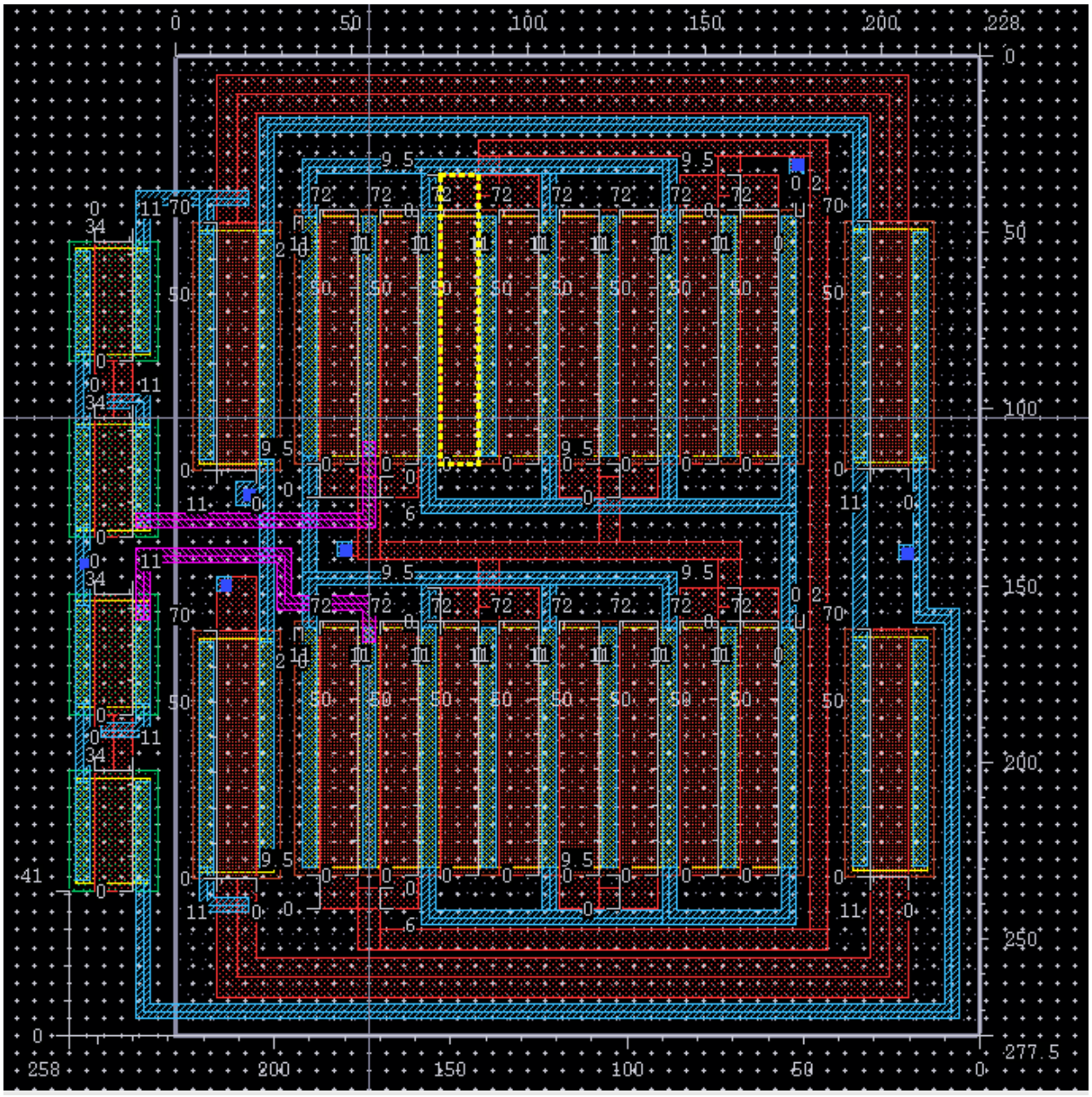
Layout



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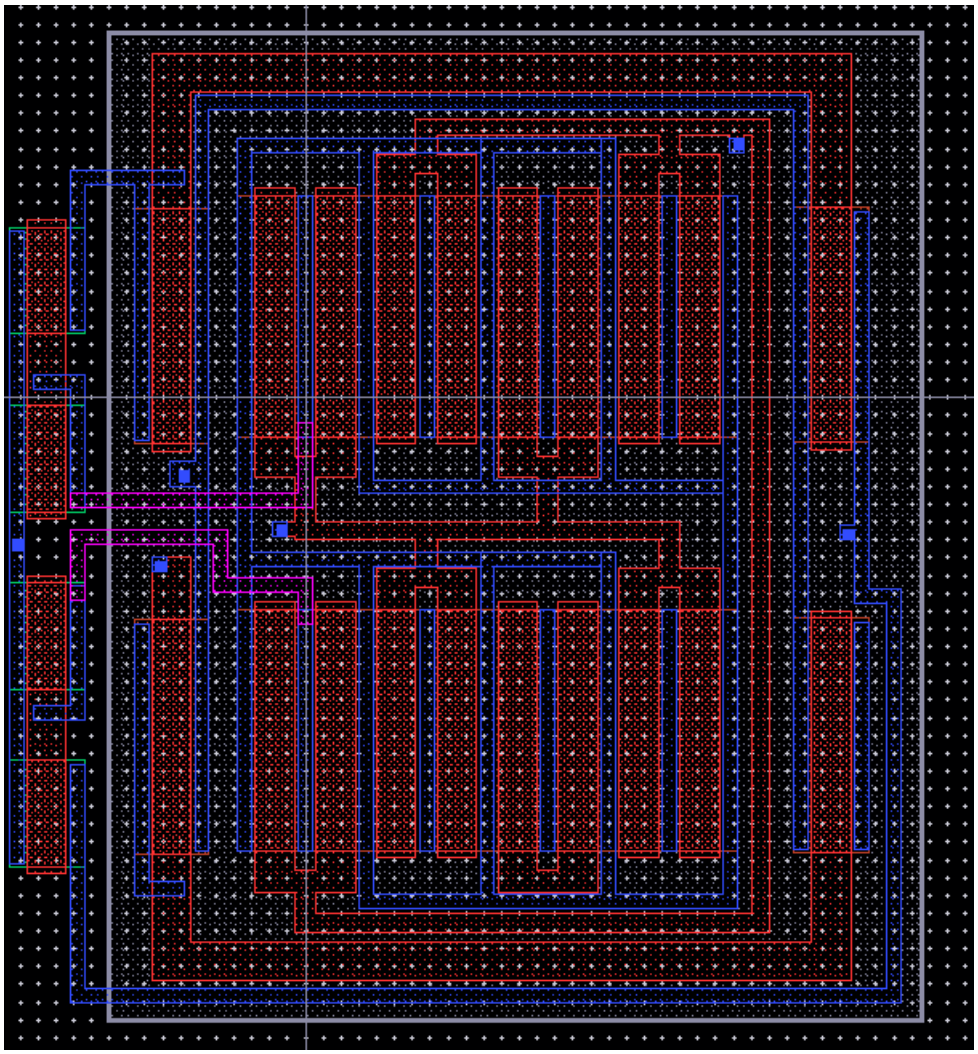
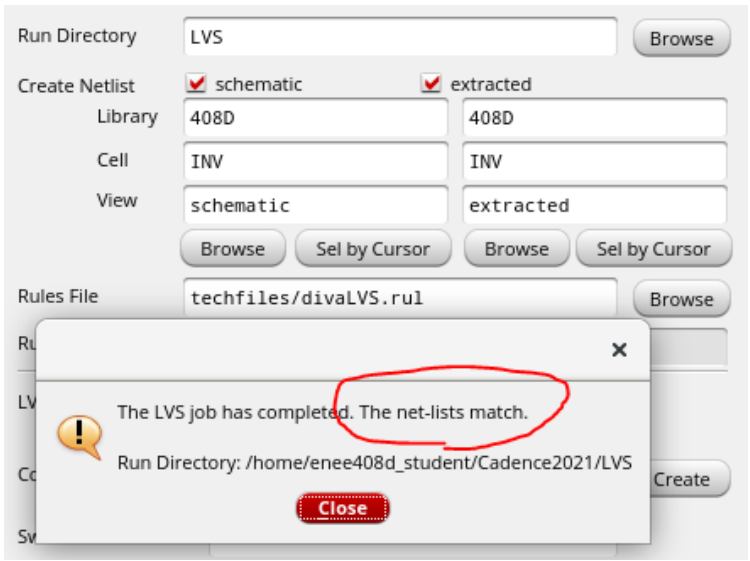
Extracted





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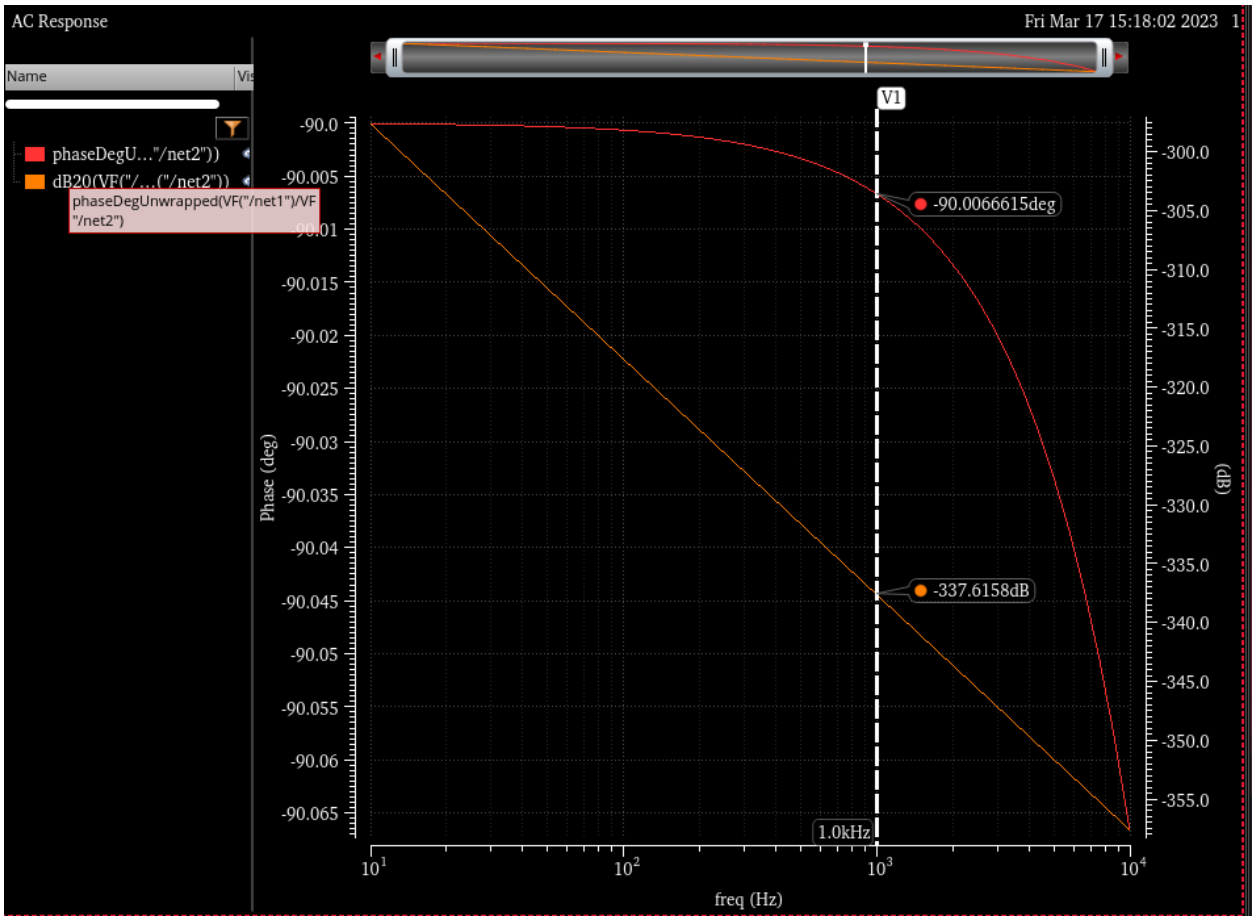
AC Analysis



Outputs

	Name/Signal/Expr	Value	Plot	Save	Save Options
1	Unity Gain Freq		☑	☐	
2	Open Loop Gain	wave	☑	☐	
3	F-3db Freq	14.19	☑	☐	
4	Phase	wave	☑	☐	
5	Power Consumption	61.5u	☑	☐	
6	Phase Margin		☑	☐	