MOSFET Characteristics
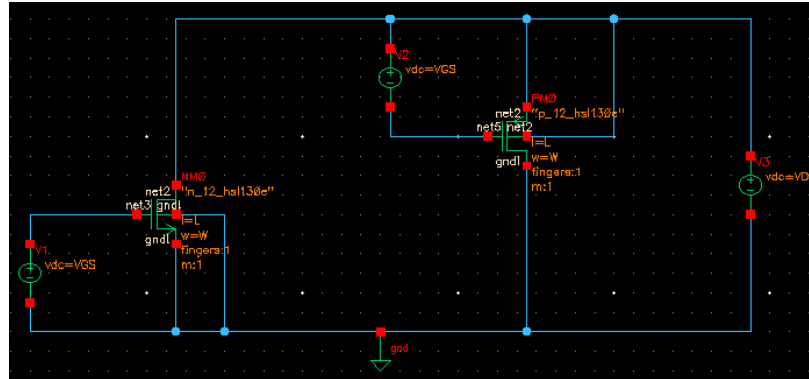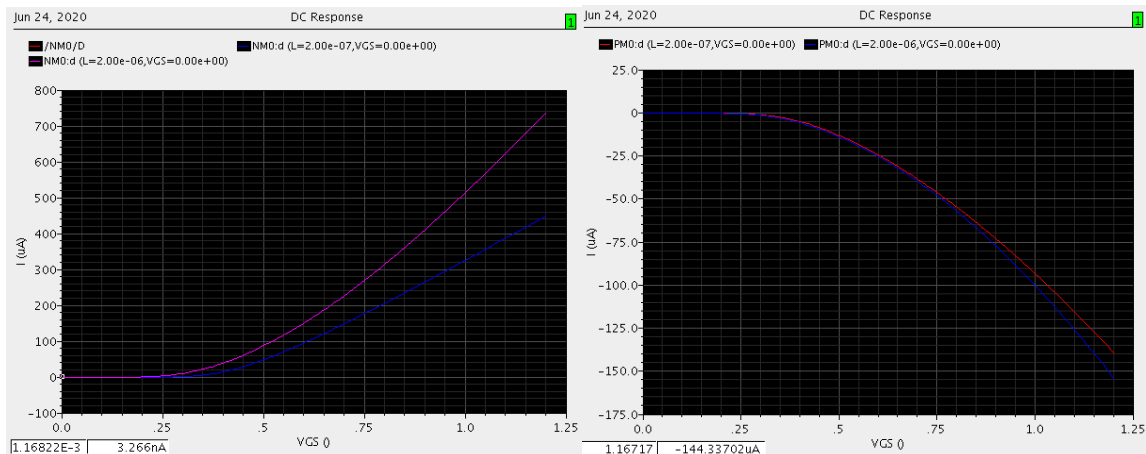
SOFTWARE TOOL: CADENCE VIRTUOSO

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MOSFET

ID vs VGS:

- $VDS = VDD = 1.2$ V
- $VGS = 0: 10m: VDD$
- Short channel device: $W = 1\mu m$ and $L = 200nm$
- Long channel device: $W = 10\mu m$ and $L = 2\mu m$

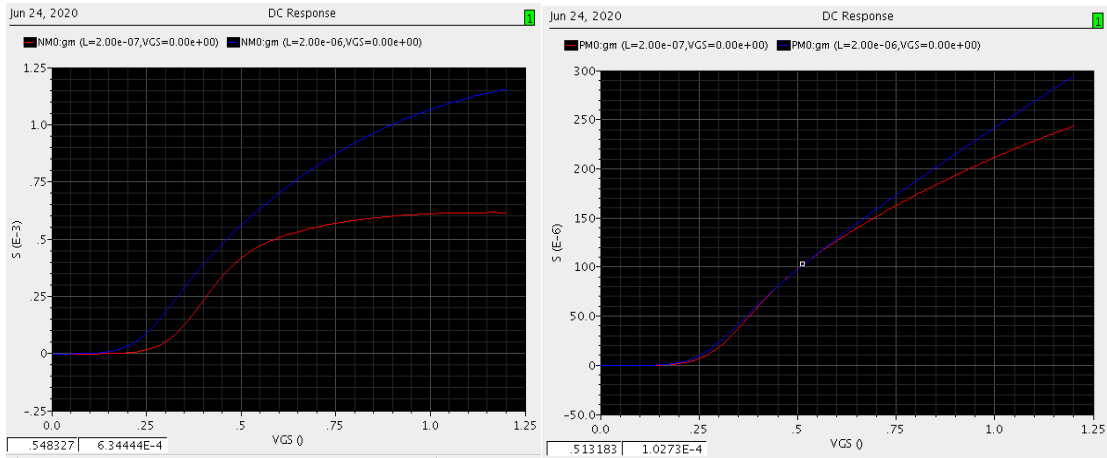Comments:

The ratio between NMOS and PMOS currents:

For short channel: 2.001

For long channel: 8.953

VTHn = 0.334 V

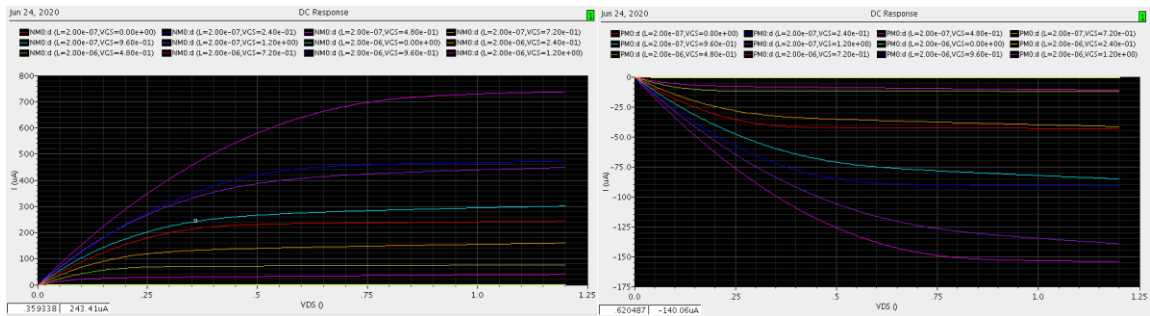NMOS is more affected by short channel effects.

gm Vs VGS:
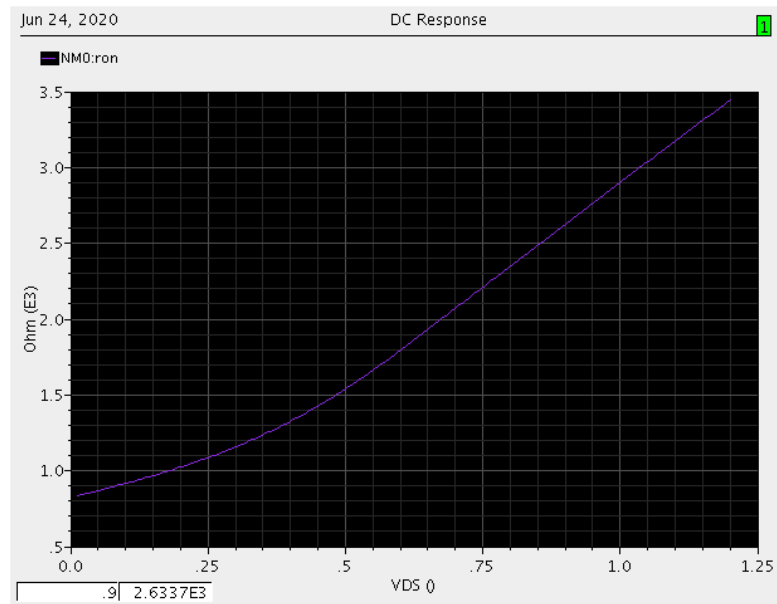

- $VDS = VDD = 1.2$ V
- $VGS = 0: 10m: VDD$
- Short channel device: $W = 1\mu m$ and $L = 200nm$
- Long channel device: $W = 10\mu m$ and $L = 2\mu m$

ID vs VDS:

- $VDS = 0: 10m: VDD$
- $VGS = 0: 0.2: VD$
- $VDD = 1.2$ V
- Short channel device: $W = 1\mu m$ and $L = 200nm$
- Long channel device: $W = 10\mu m$ and $L = 2\mu m$

ro vs VD:

- $VDS = 0: 10m: VDD$
- $VGS ≈ VTH + 0.5V$
- $W = 10μm$ and $L = 2μm$