Plotting gm

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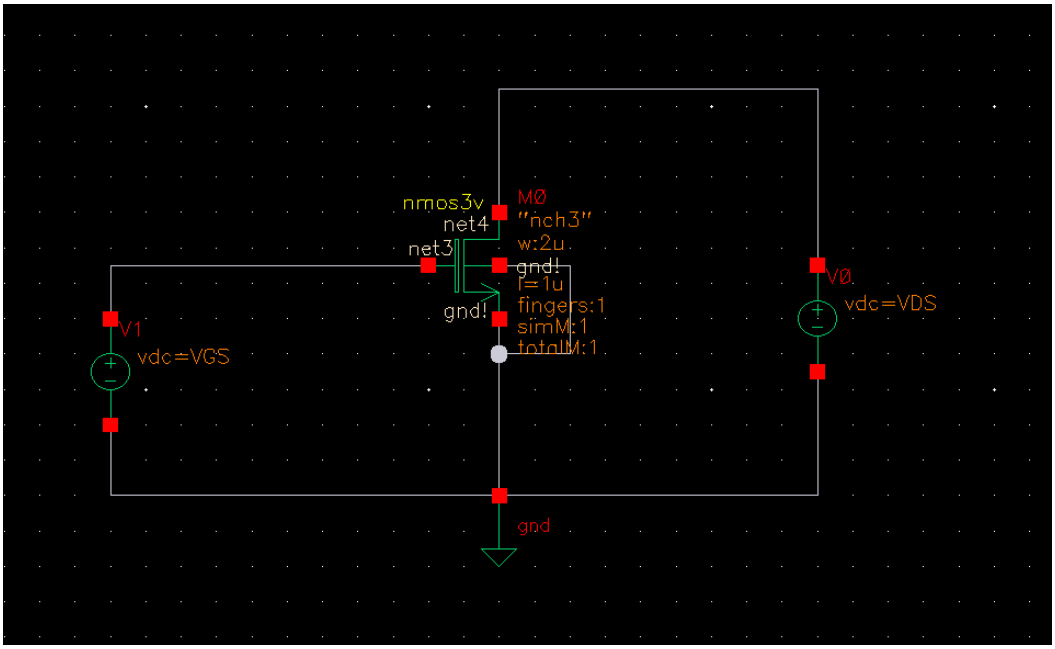
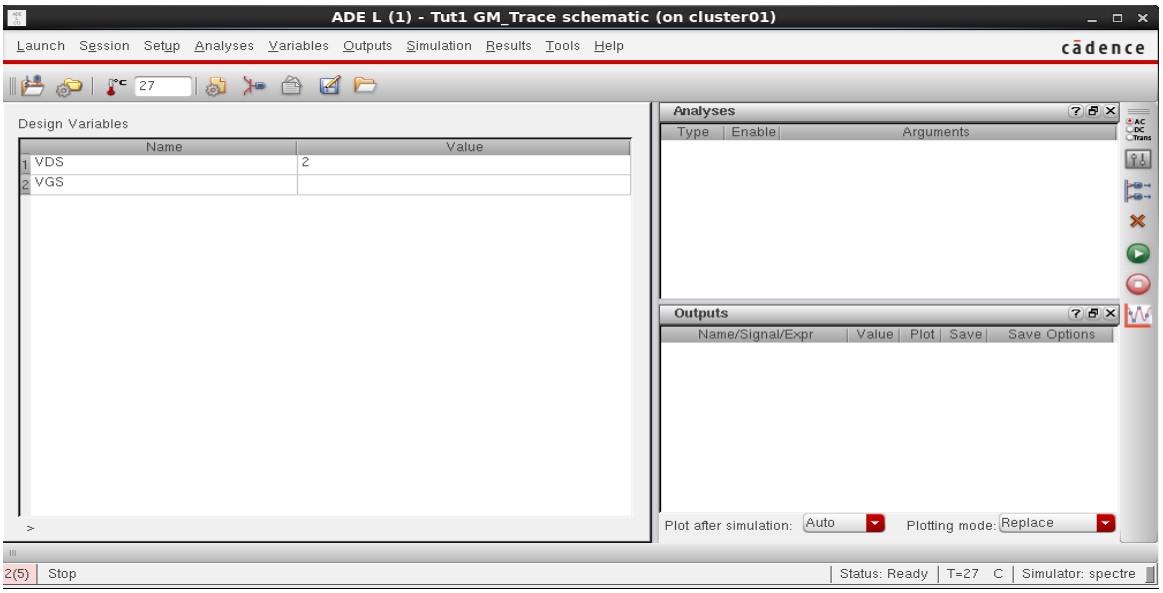
1. Create a schematic as shown in the figure. It should include a nmos3v from the tsmc18 library, with a width of 2u and length of 1u. A drain source voltage of VDS, and a gate source voltage of VGS.

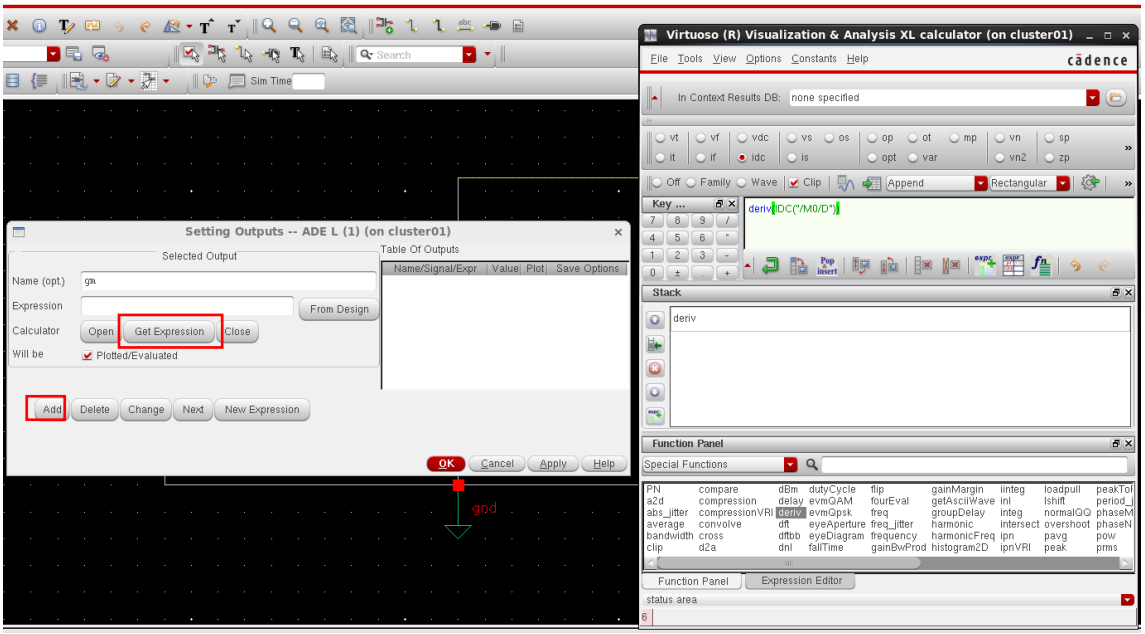


2. Launch ADE L by going to **Launch → ADE L**. Copy the design variables from the schematic to the ADE by going to **Variables → Copy from Cellview.** Set VDS to 2.



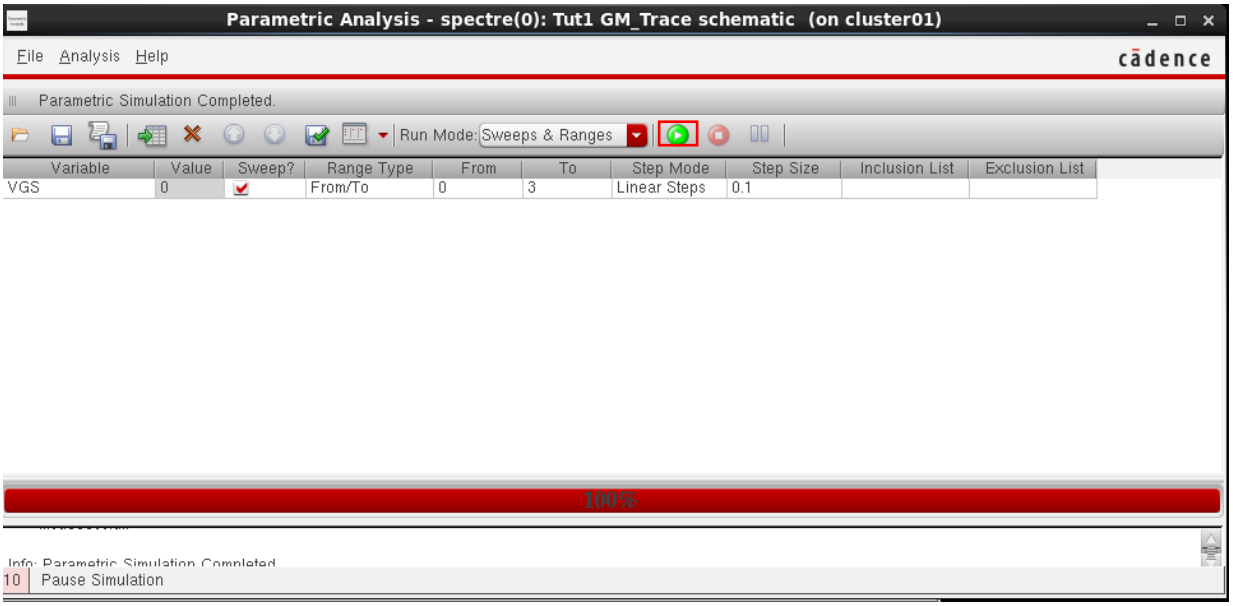
3. Go to **Outputs → Setup → type gm as the Name.** Open the calculator by pressing **Open.** Select **idc** and then click the drain terminal of the MOSFET. IDC("/M0/D") should appear. From the function panel select **deriv.** The expression in the calculator should match the one in the figure.

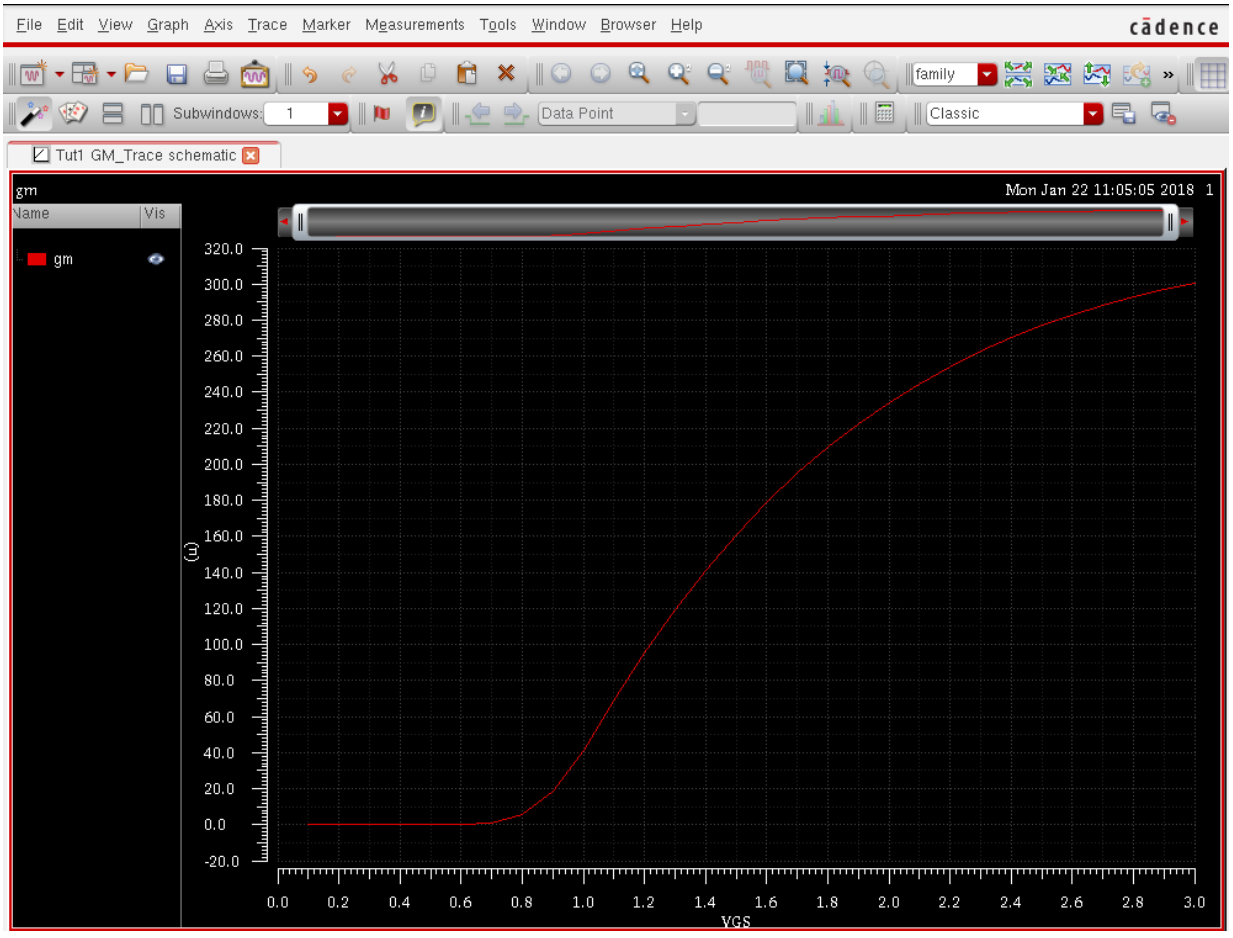
4. Next from the Setting Outputs window, under calculator select **Get Expression** – shown



in red in the above figure -- this will pull the expression from the calculator to the Expression entry. Then click **Add → OK.**

5. Next go to **Analyses → dc → Check Save DC Operating Point → OK**
6. Go to **Tools → Parametric Analysis** and set up the parametric sweep as shown in the figure. Variable: VGS, Range Type: From/To, From: 0, To: 3, Step Mode: Linear Steps, Step Size: 0.1.
7. Run the simulation from the parametric analysis window, and you should get a plot that looks similar to the one shown in the figure.


Parametric Analysis - spectre(0): Tut1 GM_Trace schematic (on cluster01)
File Analysis Help
cadence
Parametric Simulation Completed.
Run Mode: Sweeps & Ranges
Variable Value Sweep? Range Type From To Step Mode Step Size Inclusion List Exclusion List
VGS 0 From/To 0 3 Linear Steps 0.1
100%
Info: Parametric Simulation Completed.
10 Pause Simulation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VGS