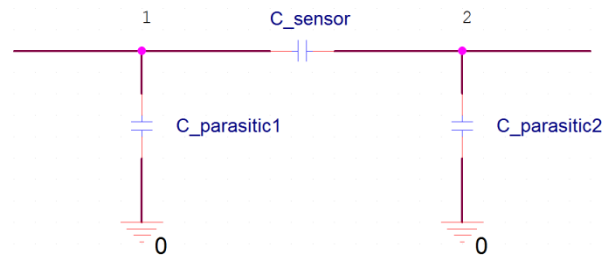


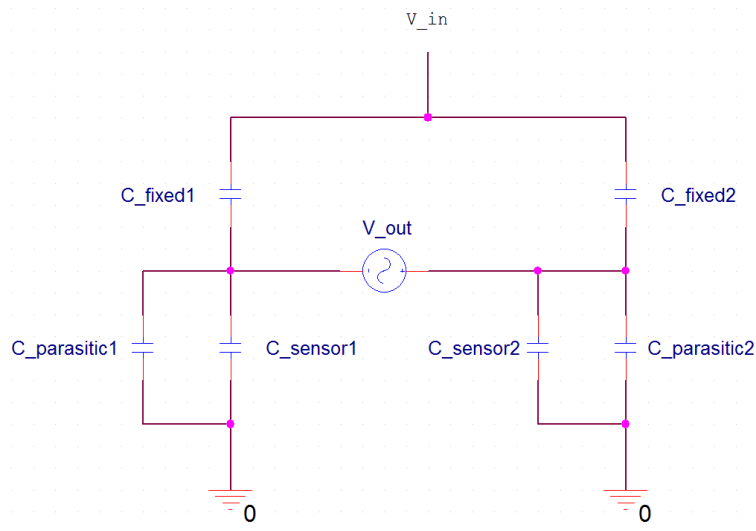
Model of my sensor:



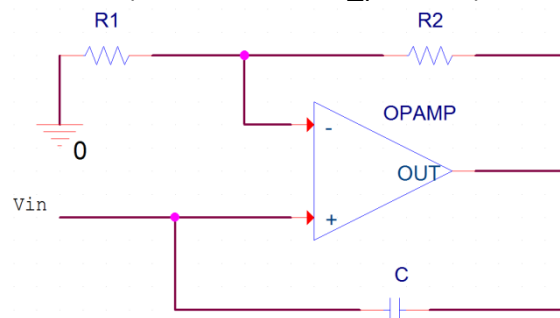
Two requirements are imposed:

- 1) Sensor readout circuit must be 10s of feet away and will be connected to the sensor via long lead wires resulting in the above parasitic capacitances
- 2) One of the ports (1 or 2 above) must be grounded. Thus one of the parasitic capacitances will not have any effect. But the other one will.

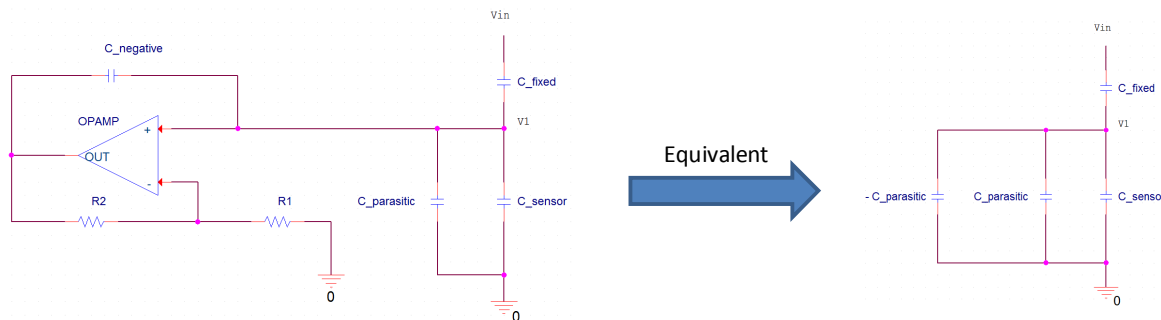
I'm thinking of using a capacitive AC bridge to measure the differential capacitance (circuit shown below):



I've thought of using a capacitive negative impedance converter (NIC) (shown below) to eliminate the parasitic capacitance ($R1=R2$ and $C = C_{\text{parasitic}}$):



This circuit connected to one arm of the realistic capacitive bridge and the resulting equivalent circuit is shown below:



I thought that this will work, but Pspice simulation shows that even with the NIC, the sensitivity of the output to changes in my sensor capacitance is severely degraded.

