ECEn 550 – MEMS
Fabrication Lab
Week 6
"Capacitive Switch Part B"

Description

In this lab exercise you will test the capacitive switch structures you made in Week 5. These tests will include capacitive changes versus voltage, and attempting to find the pull in voltages for these structures.

Major Objectives

1. Switch motion and pull-in voltage. There are a large variety of capacitive switch sizes and shapes on your wafer (if everything went correctly in Week 5's lab). The biggest changes in the devices are to the suspension length and width. Using a probe, the probe station, and the 4145 parameter analyzer connect the silicon substrate to ground and then touch a probe to different aluminum electrodes. Apply different voltages to the switch using the 4145. Can you see the switch moving up and down using the microscope? Slowly change the voltage and try and determine the pull-in voltage for the switch. Plot pull-in voltage versus the width and length of the suspended area of the switch.

2. Switch capacitance. If the switches are moving properly, their capacitance should change as voltage is applied. Using the CV analyzer next to the probe station, apply different voltages to the switch and monitor the capacitance. Plot capacitance versus voltage for several different switches. Does capacitance scale with switch area?