



# Modelling and simulation of GNP/PDMS flexible strain sensors

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### Abstract:

A novel flexible resistive-strain sensor based on (GNP)/PDMS prepared in the lab was reported to have good strain sensitivity, stretchability and gauge factor. An equivalent computer model of the same is being formulated using COMSOL multiphysics.

### Applications:

Pulse monitoring, motion detection

### Discussion:

A straight line characteristic was observed and tallied with expectations. The slope and the resistance values are mismatched, indicating that better material modelling would be required.

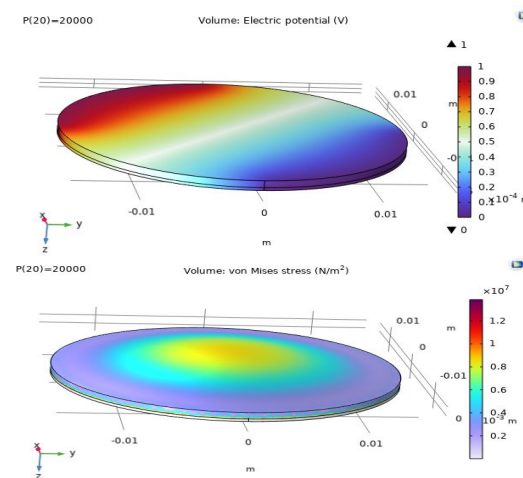
The model inherits a significant portion of its characteristics from graphene and graphite models. The PDMS model, too, does not incorporate the curing-agent-to-base ratio used in its preparation. Improved modelling is in progress right now.

### Methodology:

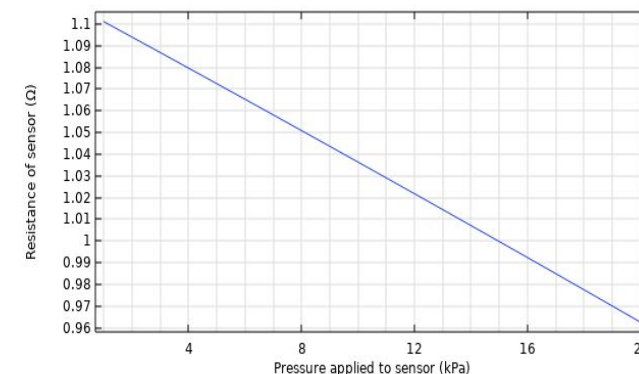
The geometry was designed, and the substrate and coating materials were assigned from the basic materials library. The missing parameters, particularly the piezoresistive coupling coefficient, were estimated and selected. A parametric study was performed by varying the pressure boundary load. The resistances exhibited were tabulated and plotted.

### COMSOL Modules Used:

AC/DC, Semiconductor, Structural Mechanics, CAD import



### Selected Images:



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