Simulation and Performance Analysis of Nanowire Design with Different Variants

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Abstract

This paper deals with an integrated numerical and experimental analysis work aiming at the investigation of the thermal stress on nanowires in electronic gadgets especially computers and mobile phones. The comparative study of the nanowires are analyzed through the Thermal Stress physics using different variants such as Cu, Al, ZnO, Si(c), SiO2 which can be used in sensors, solar cells, LCD, batteries. The main goal of the research is to find effect of nanowire dimensions related to thermal stress developed by the gadgets. During the experimental measurements, three different combinations of materials are used to design a nano probe that can indicate the temperature increase on the surface of gadgets. In this study, the deformation in the nanowires due to thermal variations produced by the gadgets is simulated using COMSOL Multiphysics®.

Keywords: Gadgets, Nanowires, Thermal stress, Deformation.

Reference

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Figures used in the abstract

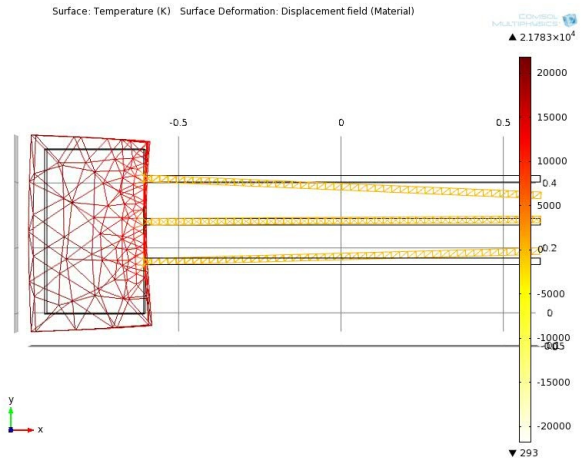

Figure 1: This figure describes the surface deformation of nanowires

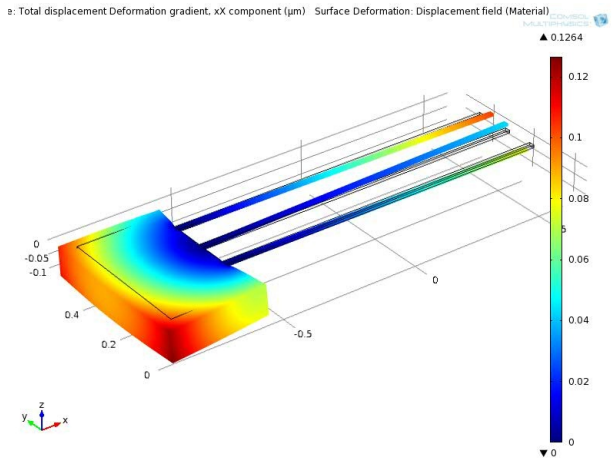

Figure 2: this figure shows the deformation gradient on the nanowire due to the temperature increases in the nanowire

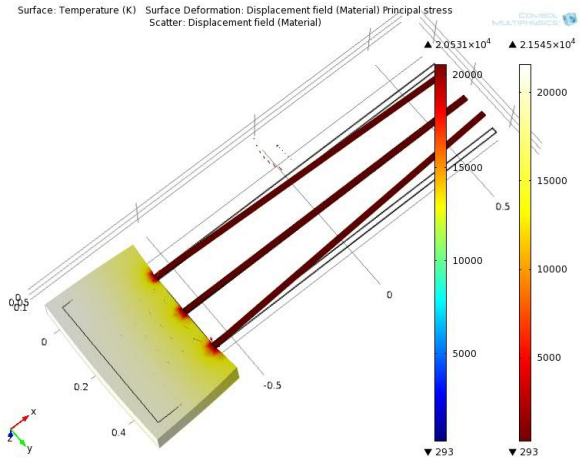

Figure 3: It shows the scatter volume in the nanowire due to the deformation in the leads of the nanowire.

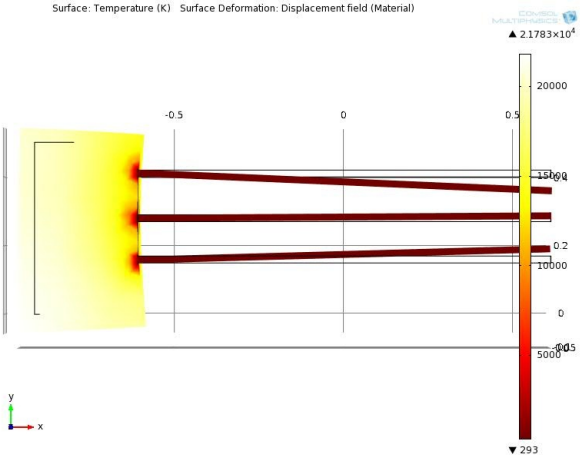

Figure 4: It describes the temperature gradient over the entire nanowire and its response.