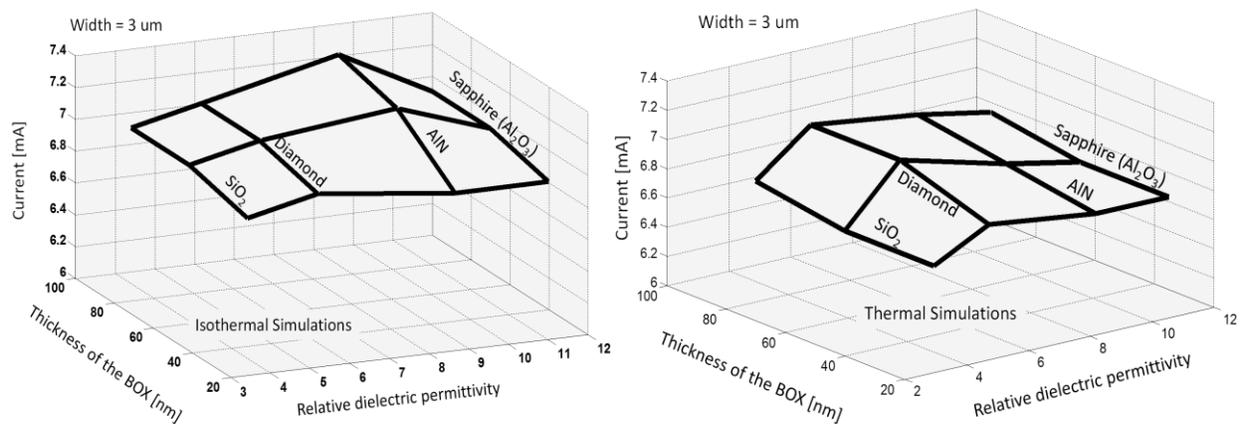


## Suleman Sami Qazi

Working as a graduate student, Suleman Qazi is pursuing his PhD in Electrical Engineering at ASU. His past work at ASU involves simulation of the electrical and thermal transport properties of materials in alternative device technologies. Two separate modules were developed for that purpose. A generic bulk Monte Carlo simulation code that basically solves the Boltzmann transport equation for electrons; and an extension to this code, that solved for the bulk properties of strained silicon. Simulation results for the average drift velocity and the average electron energy obtained from this work were in close agreement with published data.

A Monte Carlo device simulation tool was employed to integrate the effects of self-heating into device simulation for Silicon on Insulator (SOI) devices. The effects of different types of materials for buried oxide layers were studied. Sapphire, Aluminum Nitride (AlN), Silicon dioxide (SiO<sub>2</sub>) and Diamond were also used as target materials of interest in the analysis and the effects of varying insulator layer thickness were also investigated. It was observed that although AlN exhibits the best isothermal behavior, diamond was the best choice when thermal effects were accounted for.



**Figure 1** (Left panel) Isothermal simulations. (Right panel) Thermal simulations

Currently he is working on implementation of a multi-grid Solver for Poisson Equation solution in 2D which would eventually be replaced by an Algebraic multi-grid Solver in 3D. This work is a part of research project on the simulation and development of the 3D FINFET Device solver, being conducted in collaboration with IMEC in Belgium.

Suleman is the recipient of Fulbright Scholarship from Pakistan. He holds Bachelors and Masters degrees in Electrical Engineering from University of Engineering and Technology, Lahore Pakistan. He can be reached at [sqazi@asu.edu](mailto:sqazi@asu.edu).

*Papers Published on this topic:*

1. (best poster) S. Qazi, K. Raleva and D. Vasilevska, "Electrical and Thermal Transport in Alternative Device Technologies", *IMAPS: 10th International Conference and Exhibition on Device Packaging*, Radisson Fort McDowell Resort and Casino Scottsdale/Fountain Hills, Arizona USA, March 11-13, pp. 270-273, 2014.

