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Quantum Dot Lab: Incorporation of Alloys in the Capping Layer of Multi-layer Quantum Dots

Unmesha U Kale, Prasad Sarangapani, Jim Fonseca, Gerhard Klimeck

Network for Computational Nanotechnology
Purdue University

Abstract: Quantum dots have enhanced the performance of several optoelectronic devices. Designing and obtaining optimal quantum dot structures requires intensive simulation. Quantum Dot Lab on nanoHUB provides such a simulation platform. The simulation is fully parallelized and depending on the structure, the tool decides the computational resource which is to be used for the simulation. To obtain accurate predictions of quantum dot structures it is essential to provide a variety of simulation parameters to the user. In this research a user interface was created where the user can simulate alloys by Random Distribution and Virtual Crystal Approximation(VCA) Distribution in the capping layer of a multi-layer quantum dot. Future work includes alloy distribution in other layers of the multi-layer quantum dot namely the substrate, the wetting layer and the quantum dot.

Keywords: *Quantum Dot Lab, Alloy distribution, Simulations*