The effect of position variation of an electrical charge or dipole on the electronic transport of a simple cubic nanocrystal

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Abstract
In this paper, we investigate the electrical conductance and density of states of a nanocrystal including an electrical charge or dipole located at cross section of nanocrystal by using Green’s function method in the nearest neighbor tight-binding approach. The results show that moving the electrical charge from center to the edge of the nanocrystal increases the system transmission coefficient. In contrast, shifting the electrical dipole from the center to the edge of the nanocrystal, decreases of the system conductance.

Keywords: electrical charge, electrical dipole, Green’s function, tight-binding, conductance

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