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# MATERIALS SCIENCE AND ENGINEERING

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## APPLIED CRYSTALLOGRAPHY

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### **A numerical analysis of the dependence of absorbed power on the size of ZnO/Au nanorod in ZnO/Au (Nanorod)-PbS (Quantum Dot) hybrid structure**

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A hybrid structure of ZnO/Au core-shell nanorod (NR) on top of PbS quantum dot (QD) array is simulated for the power analysis of ZnO/Au nanorods' size dependence of absorbed power using FDTD simulator. Total Absorbed Power (TAP) is observed which is dependent on nanorod's length and radius. The radius of the ZnO/Au core-shell nanorod is 6.5nm where the ZnO core has a radius and length of 4.5nm and 38nm, respectively. The Au shell has a thickness of 2nm. As the number of NR is increased, the peak value of the total absorbed power also increases for a wavelength of 640nm. The peak value of total absorbed power for 1 nanorod and 5 nanorods is found to be 0.0366 and 0.1645 respectively. With the increase of the radius of the NR from 6.5nm to 7nm, the peak of the wavelength shifts from 640nm to 533nm. The relationship between absorbed power and wavelength is illustrated for an increasing number of nanorods.

#### **Biography**

Kanij Mehtanin Khabir has completed her undergraduate (BSc) in Electrical and Electronic department from University of Dhaka and now she is doing her graduate (MSc) in the same department. Her research interest is on nanotechnology. She has published two journals. Now she is holding position as Chair of IEEE Student Branch, University of Dhaka.

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