

1067-00-1676

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*Optimization of an Antenna Structure for a Photovoltaic Nanodevice.*

Finding a cleaner, renewable energy fuel source is increasingly important. One possible solution to this problem is to build a photovoltaic nanodevice that utilizes the reaction center from Rhodobacter Sphaeroids. We developed a new methodology that allows the optimization of a structure and design of a wide range of photovoltaic nanodevices. In this research, the methodology is used to test a particular design with metal nanospheres sandwiched in between two nonmetal transparent electrodes. This design takes advantage of localized plasmonic effects. We have found the optimal structure that allows a maximum amount of light in the charge separation region for a fixed light wavelength. This work has been completed as a part of the 2010 REU Program at George Mason University funded by the NSF-REU and DOD-ASSURE Programs. (Received September 21, 2010)