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Enhanced Efficiency of Solar Cells Using Reflectors and Metamaterials YUN JIN JEONG, RICHARD KYUNG, Choice Research Group — Solar power is produced by converting energy from the sunlight to electricity, thermal energy and other types of energy. To find the optimum environment for the maximum efficiency of solar energy production, this research shows various experiments to test different reflector shapes, altering the shape of the reflector on the solar panel to achieve highest efficiency. These alterations include plane reflector, spherical reflector, and parabolic reflector. By measuring the temperature change on the surface of the reflector and the amount of electricity produced by a voltmeter, the efficiency of each reflectors are compared. Light intensity and incident angle are considered since they are the most significant and influential factors of the production of electricity from photovoltaic cells. This paper also shows that how infrared or visible-frequency electromagnetic waves works with nano-scaled metamaterials, resulting in augmented payloads, longer missions and increased payloads. A novel concept in UAVs and satellite battery technology involves Surface Plasmon Polariton. The SPP uses metals and metal oxides to store solar energy, maximizing optical strength by exciting absorption layer with SPP mode through adjustments made with the incident light.

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