Efficient Plant-Based Solar Array

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?. Motivation Although solar energy is environmentally friendly and has no worry of depletion, its efficiency is only 8~15%, much smaller than other alternative energies, and needs a big installation area. This is a big problem since the demand for private photovoltaic systems is getting higher. To solve these problems we built solar arrays by copying the structure of plants. ?. Method of Research To make an efficient solar array, we first digitized the structure of plants and built the models based on that. We divided the models into group A(completely copying plants) and group B(built with artificial values). Finally we measured the electrical power and compared the value of models. When comparing the electrical power we created a light source concerning annual and diurnal motion of the sun. ?. Conclusion Whorled phyllotaxis B was the best system for generating in both mono and fixed axis. Its efficiency was 196% of flat model and takes up only half the space. We interpreted the results in three ways. Firstly, the length between panels was long and gave less effects to each other. Secondly, some panels reflected light which bounced into other solar panels. Lastly, the arrangement of leaves is in spiral formation. ?. Effect and Prospect Through our research we could built models that takes up a small space and has higher efficiency. It is best fit as a single-unit private photovoltaic system. Using the new model, mass production is possible in a smaller space through a stair-like architectural structure.

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