Which Solar Reflector Increases Solar Efficiency the Most?

Buchanan, Charles (School: South Lake High School)

In order to prevent the release of pollutants due to fossil fuel usage people are switching to better alternatives like solar panels, especially in places like Texas and Florida which use more energy than any other states. Today most solar panels are made of a highly light heat absorbent energy called monocrystalline. In order to increase the efficiency of these solar panels it has become common to use solar reflectors to direct light to the solar panel. When it comes to reflectors there are different shapes and angles that are used, usually circular or straight edged. The purpose of my experiment is to see which solar reflector, if either, reflects more energy for the panel to collect. I used a 26cm x 16cm monocrystalline solar panel charging a phone through a USB to measure the efficiency of the reflectors in watt-hours (1%=105 watt-hours). The phone was checked every 15 minutes. Both reflectors are made of reflective-insulation material glued to some cardboard of the same dimensions. The circular reflector has a circumference of 13cm and is 40cm high. The angled reflector was constructed by cutting three 11.5cm wide by 40cm high pieties of the reflective material, positioned at 45 degree angles. There will also be a control without a reflector. The trials took place on three different days with of full sun with similar temperatures. My hypothesis is that if a curved solar reflector is aimed at a solar panel, then it will produce the highest level of solar efficiency as opposed to no reflection onto the solar panel or a solar reflector with straight edges. The experiment supported my hypothesis with the curved reflector producing an average of .273 watt-hours opposed to .231 and .210 for the angled reflector and no reflector trails respectively.