Gone With the Wind
New Mexico Adventures in Supercomputing Challenge
Final Report
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Team number:039
Koogler Middle School

Team members:
Nikki Eagle
Julie Bagley
Caleb Elder
Kaylee Van Buren
Scott Blankenship

Sponsoring Teacher:
Pamela Arzu

Project mentor:
None

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Executive summary

In pictures of airfoil, the pointed end is on one side and the larger end on the other and almost always show the air being blown a certain way; towards the fatter end. What would happen if we switched the direction of the airflow? Instead of the way previously mentioned, the air would come towards the pointy end.

Our project involves proving that this style of solar car is better(or worse) than the other. We believed that a solar car with the nose, or more pointed part, would be faster than a car with the blunted end in front. We understand that the front end needs to "cut" through the air to enable the rest of the vehicle to "pass through" as well. In our point of view, the pointed end would accomplish that task much better than with the "fat end" forward. We thought that the pointed end would "cut" through the air better because instead of "punching" a hole with the bigger side and having the air move up, over, and around the car, the other end would just pierce through and have the air gradually slip up and off the other side. We have encountered a problem with the nose of the pointed end lifting up and flipping over once it got moving. Additional weight would have to be added to the nose to keep it on the ground, which may make it slower in this sense, but more aerodynamically effective. Is it worth it?

Introduction

Solar cars are powered by solar cells or solar panels. The cells convert the sun's light into electricity. They are called sun or "sol" because the sun is the most powerful source to use. They are sometimes called photovoltaic which means "light-electricity".

Universities and manufacturers built the first solar cars in 1839. Unfortunately the solar panels were much too large, slowing it down and it was so big that nobody wanted to buy one. That has changed dramatically.

Solar cars could be used as an alternative transportation to conserve natural gas and oil and to decrease the amount of pollution in the air. Solar generated electricity comes from light rather than manufactured chemicals. The atoms remain the same and are not involved in chemical reactions. The energy is produced when two layers of purified silicon are joined and immediately an electrostatic field with a potential of 0.5 volts is formed at their junction.

There are benefits to solar powered vehicles. The fuel source is less expensive and invasive to the earth's atmosphere. Solar energy is all around us and is a source we can access easily. The vehicles have the potential to go farther and last longer than currently manufactured vehicles.

However, there are some drawbacks. Using solar energy is still in its infancy and therefore expensive. The batteries used as backup on these vehicles have to be manufactured in the standard way which does not eliminate pollution The vehicles are much more expensive than the average American worker can afford, therefore the technology is still out of reach for most citizens.

To be more accessible to more Americans, the technology still needs lot of research and testing. Solar power needs to be harnessed and enhanced in a more inexpensive way for the solar vehicles to gain the popularity and demand of current automobiles.

Experimentation is an effective way to develop a better, more user-friendly solar vehicle. Testing different types of solar panels and holding cells is needed to further the expansion of solar mobility.

Description

The step-by-step process of our team started by choosing the project and deciding what the computer model would do. We didn't end with the same project that we began with. We ended up changing the project right before the interim report was due. This arose a problem since there was limited time remaining to complete the project.

We changed the project to solar car racing. This was much easier to find information on and to decide what the computer model would do.

We were limited to ourselves and to our teacher, (Mrs. Arzu) since our mentors stopped helping. This really limited our project and because of this we did not complete the project.

Results and Conclusions

Without a math model, computer simulations were not acquired. Testing of the airflow over an airfoil and compiling the data as a result of the experiment lead us to the conclusion that the original airfoil is the most effective design. Our research concluded that if we switch the direction of airflow it would have more eddies. Eddies created much drag on the back end of spheres and squares. Therefore, if the back end of the airfoil is more pointed, the amount of eddies is reduced.

Recommendation

As a result of our research, we recommended that more study is needed to have a more complete understanding of solar power and aerodynamics.

Works Cited

http://www.sunwindsolar.com/a_lessons/solar_beginners_notes.html

http://web.umr.edu/~dougc/solar/pardun.html

http://www.pege.org/pvworld/index.png

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