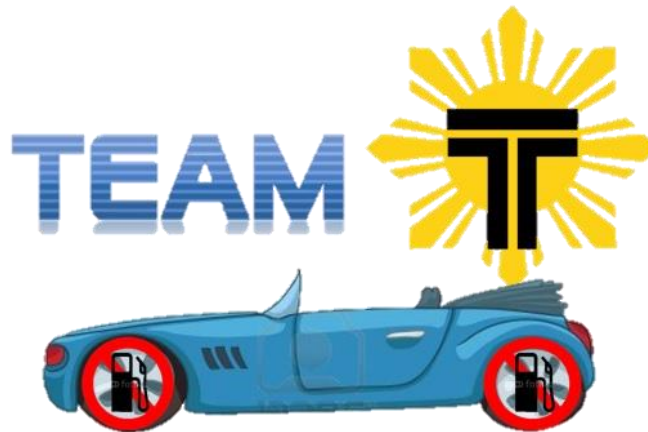


CASE SIMULINK



Remmy Nshuti

Nele Rath

Praveen Saragadam

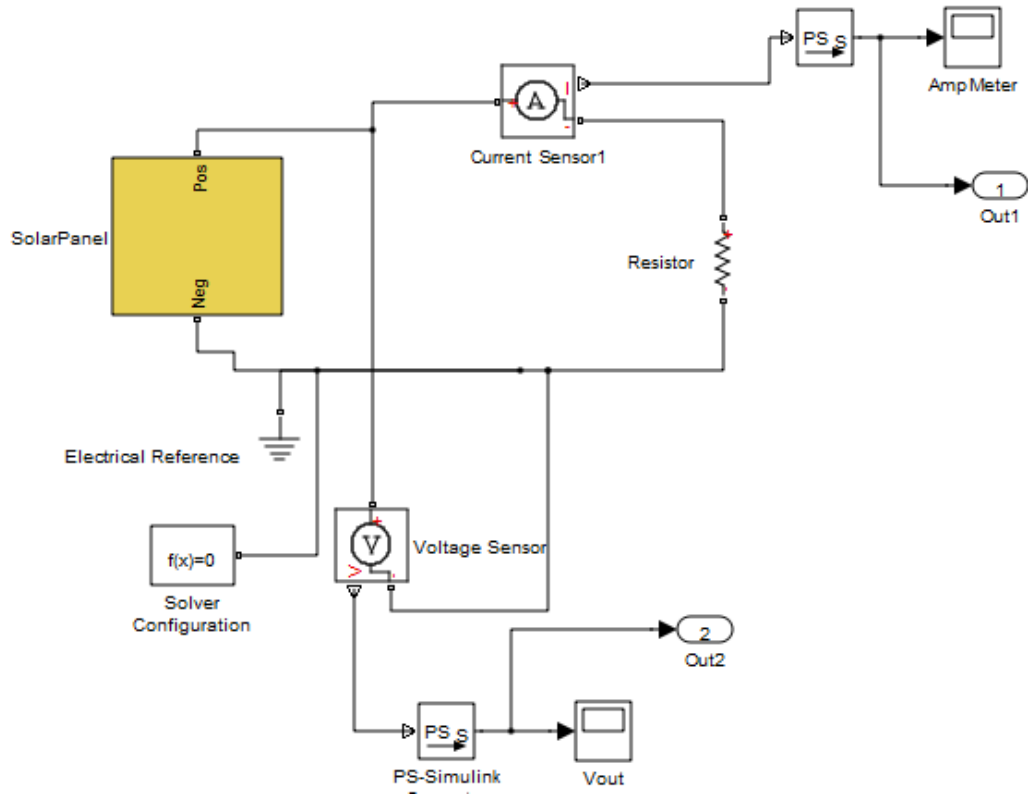
Régis Hakizimana

Varsha Manda

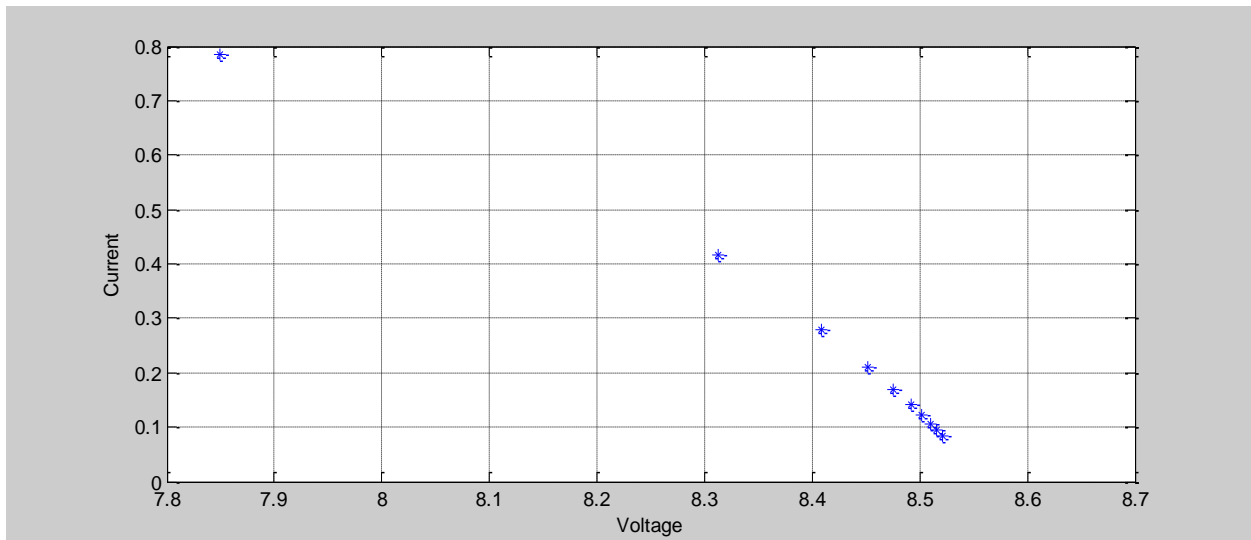
Abel F. Abraham

Case Simulink

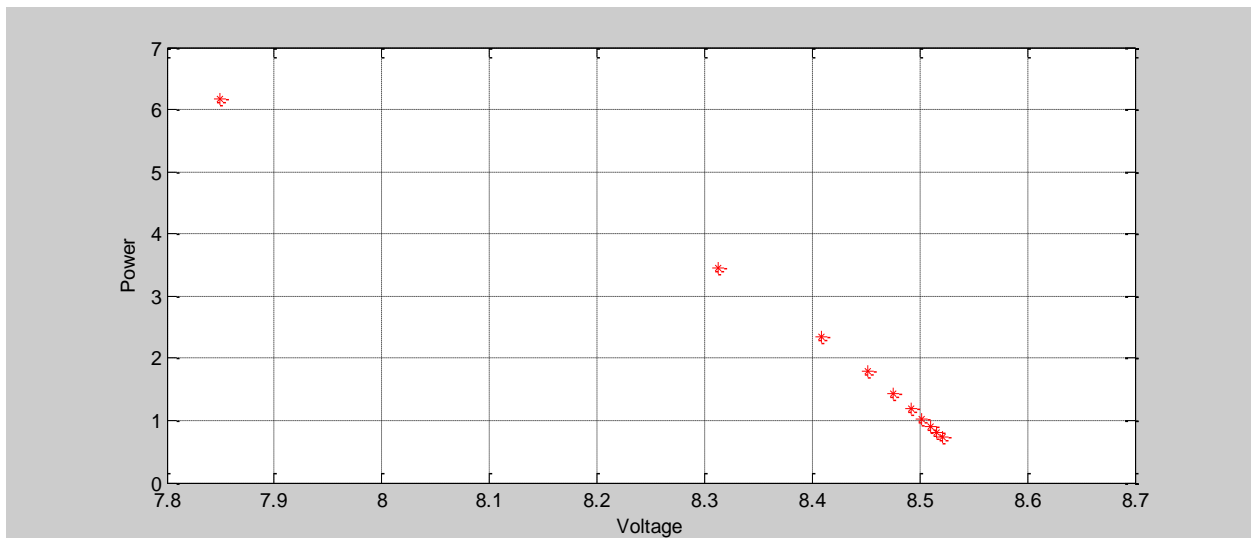
1. Simulink Solar Panel behavior



The figure above is model of our solar panel connected with a resistive load, and we are going to observe the power dissipated by the resistive loads ranging from 10 to 100Ohm every time by taking a step of 100Ohm in between the values.

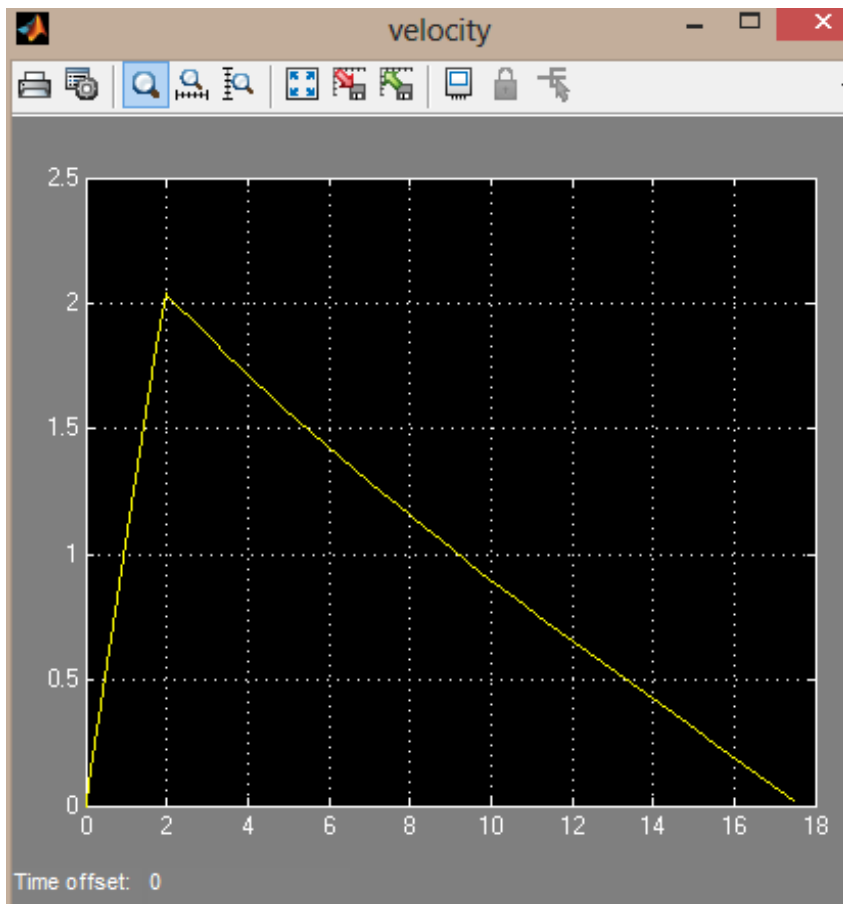


As the voltage load increase the current through the load will decrease. According to the voltage division rule you will always find the largest voltage over the largest load in the circuit, so this explains why our voltage over our resistor increases.



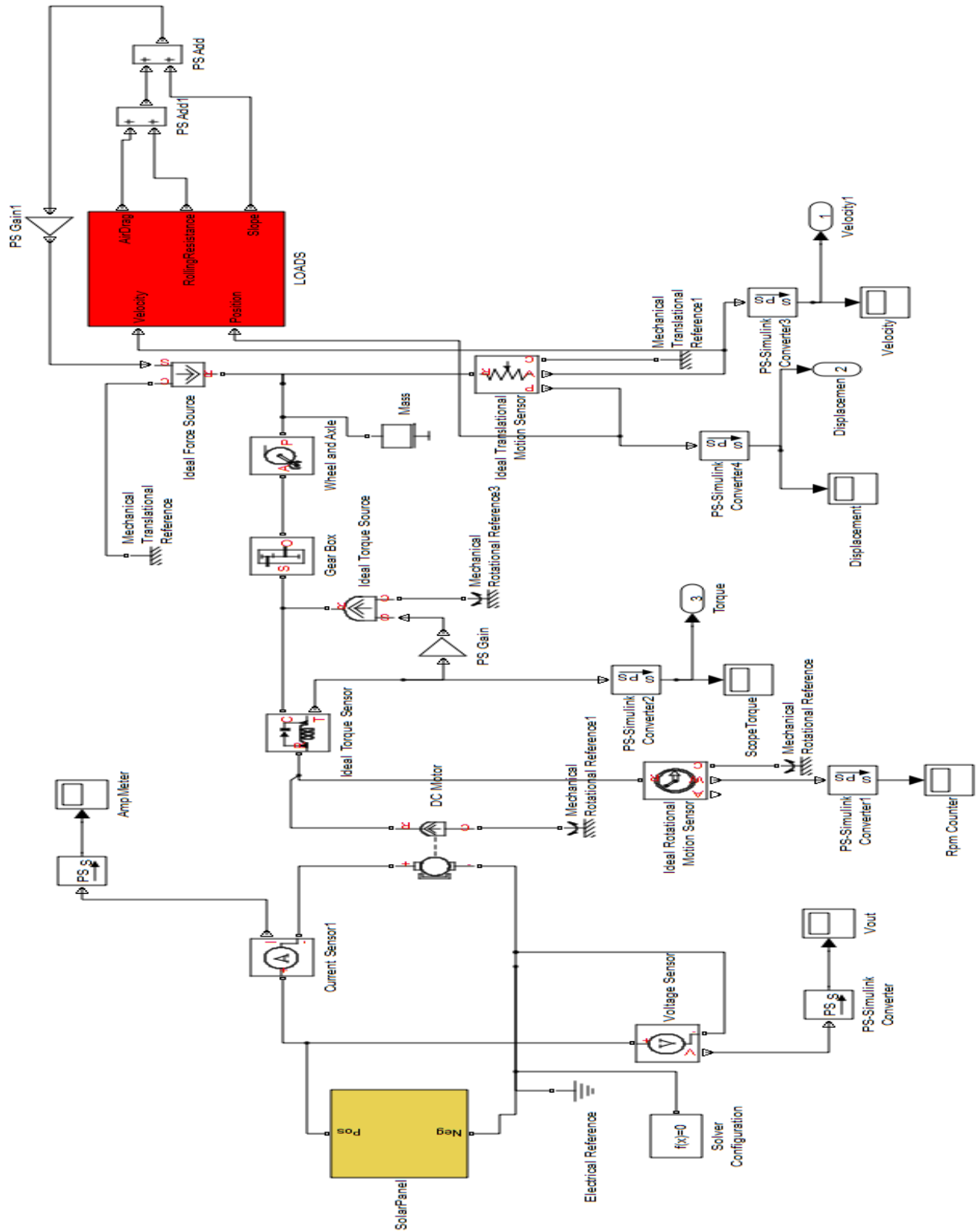
So since the resistor is pure linear circuit component the plot (voltage, power) will demonstrate the similar behavior as the plot (voltage, current).

Model Behavior without S-Panel

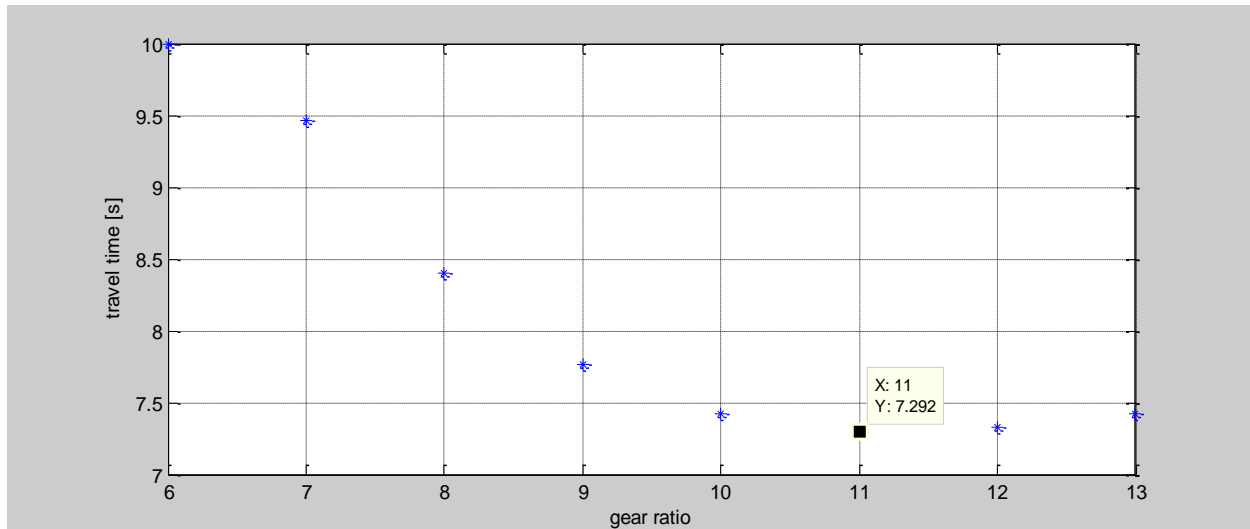


The simulation shows us that it would travel a total distance of about 17.5m if we release the car from a height of 2m. This will be the case because the ($P_E = h * m * g$) will act as the potential energy.

Simulink SSV Model

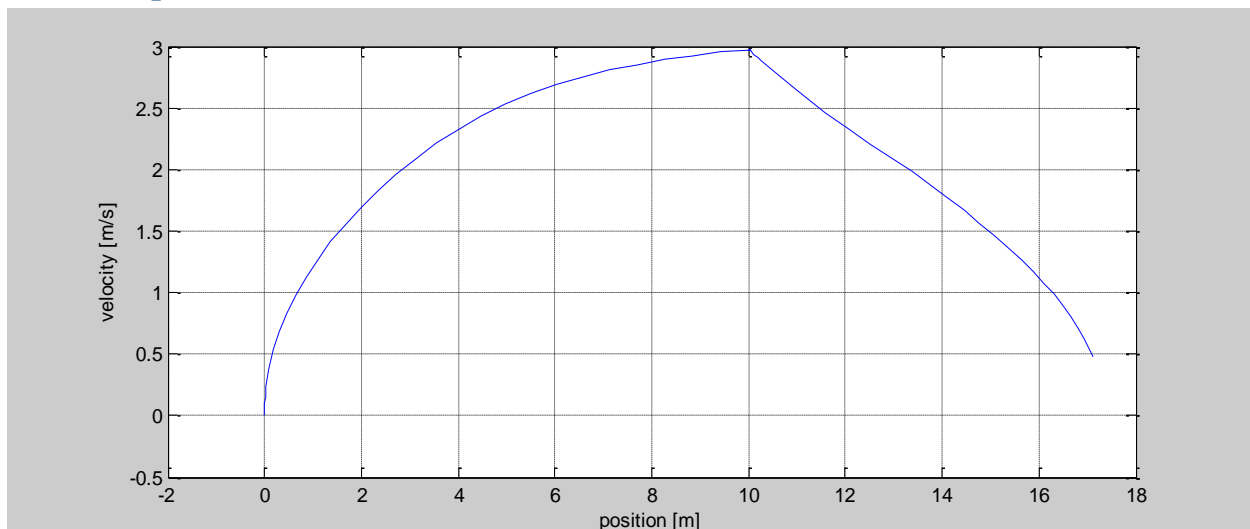


Plot of Gear Ratio Vs. Time Travelled

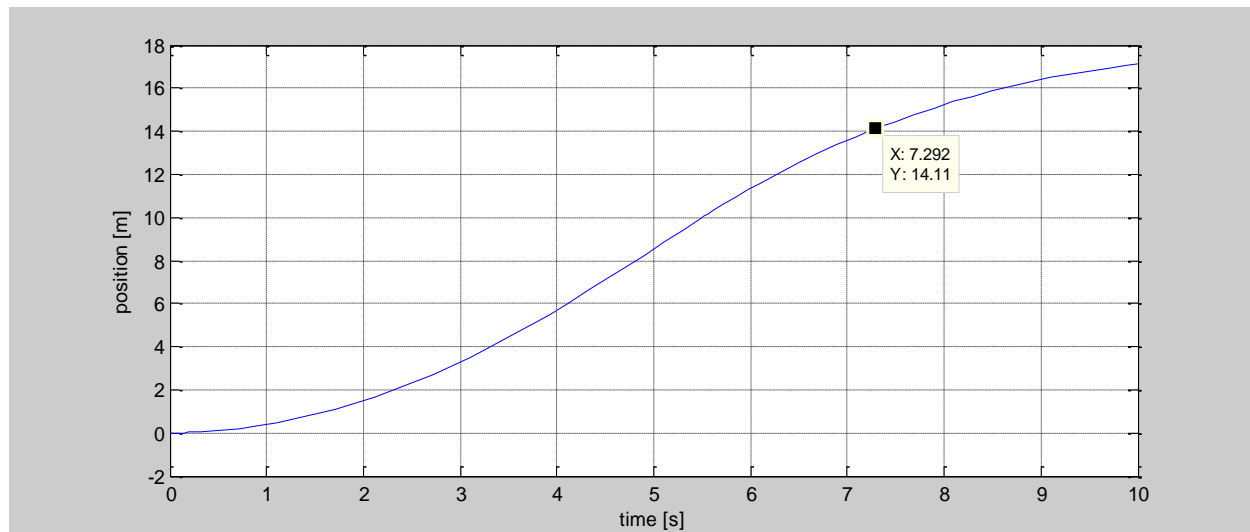


This plot above indeed confirms that the gear ratio we found the good choices was. By looking on the chart we see that ratio 11 has the lowest travel time of 7.292sec.

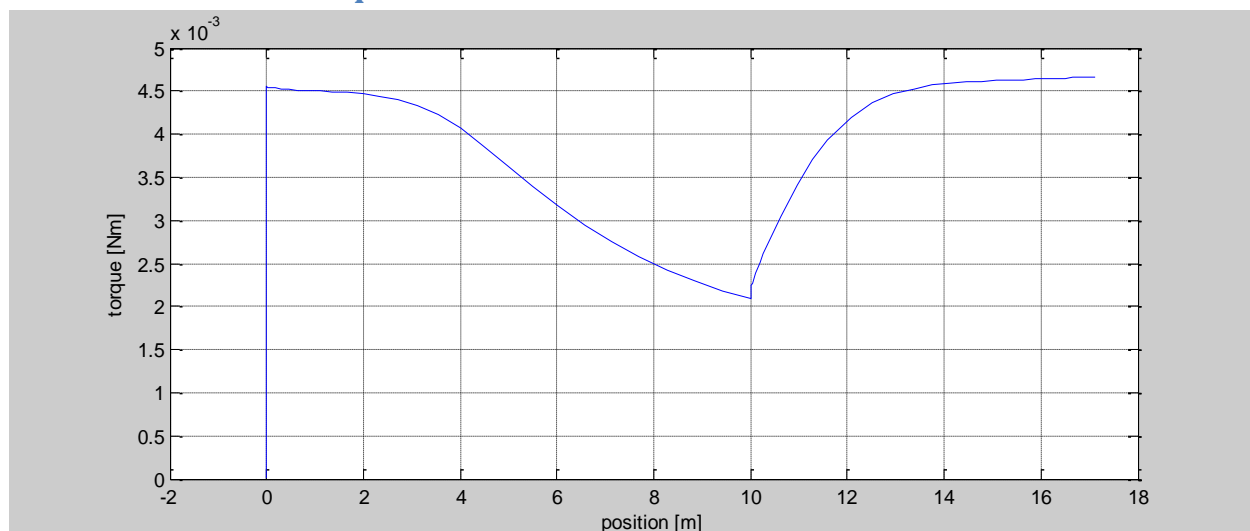
Plot Of Speed At Different Position



Plot Of Time vs. Position



Plot Position vs. Torque



This plot demonstrates that it is at initial position where you have to generate the greatest amount of torque and it appears to be logical that a while after the initial position the torques will decrease until we are at 10. And then the slope we would expect our torque to increase as we progress through.

4. Why would you do such a simulation?

Simulations like this contain everything that would happen to our model in reality. So by simulating we will understand better the behavior, the risks that we might be facing. Simulating a model is economical it saves a lot of capital and material resources. Before we create a prototype we will already have a perfect approximation. Simulations are efficient in such a way that you could not lose a lot of time searching the material and developing something that will not work after spending a whole lot of money.