

This script is a simulation of a vehicle undergoing a Moose Test. The Moose Test is a test used in the automotive industry to determine how well a vehicle evades an obstacle that appears suddenly. The maneuver is simply a double lane change where the vehicle changes lanes once to avoid the obstacle and then returns to the original lane once it is clear of the obstacle. The simulation is achieved by using a four-wheel dynamic model of a vehicle and integrating it using the Euler Forward method. The input to the simulation is a given temporal steer angle function, and an initial velocity. The vehicle parameters are those of a BMW M4, and a given function (nonlintire.m) was used to determine the forces at each tire. The output parameters of interest include inertial position, sideslip angle, longitudinal velocity, lateral acceleration, slip angles, tire loads, and roll angle. Once the initial simulation was run, the vehicle parameters were adjusted with the intention of reducing the amount of body roll the vehicle experiences during the test. These parameters are marked "modified parameter" and an explanation for why and how each parameter was adjusted is given at the bottom of the script. The parameter modifications I chose eliminated body roll altogether.