MATLAB Assignment 1b

Submitted by
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Question3:

Task A & B: Model Without ABS

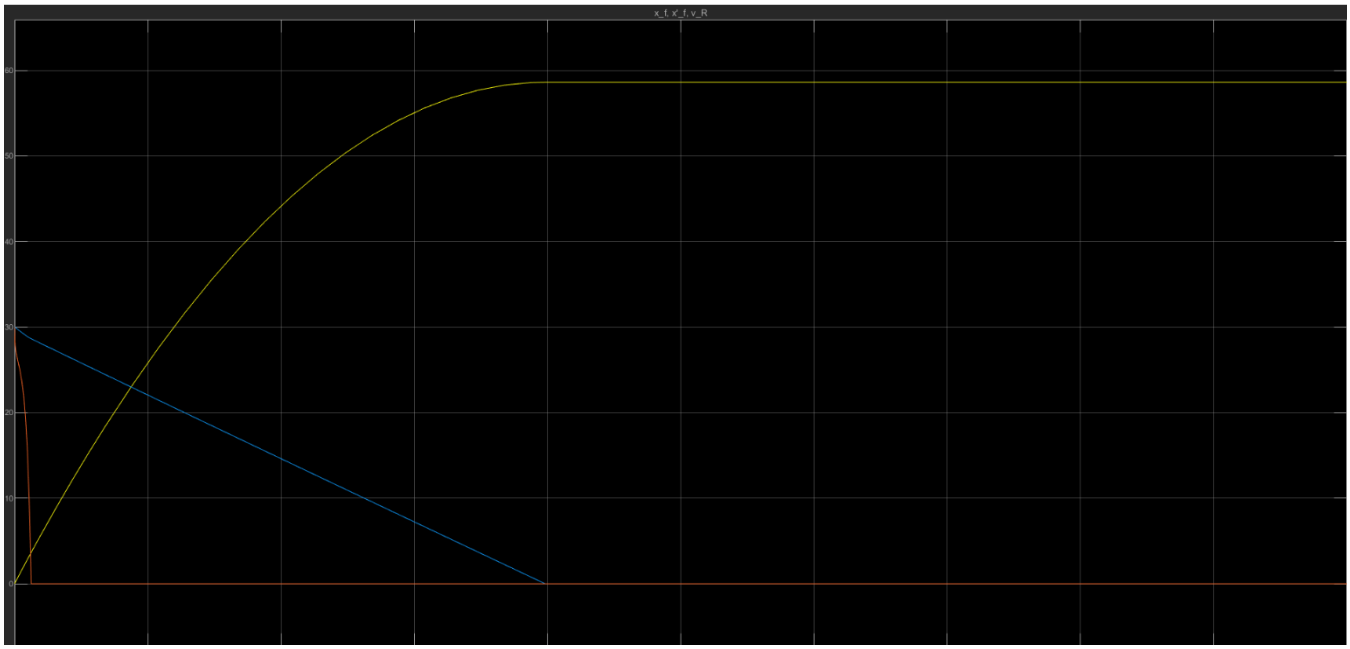

Figure 1Without ABS, Vehicle speed 30 m/s, Breaking moment = 5500Nm

The Car stops after moving 58.6 metres and takes around 4 secs approx. to stop.

Task C:

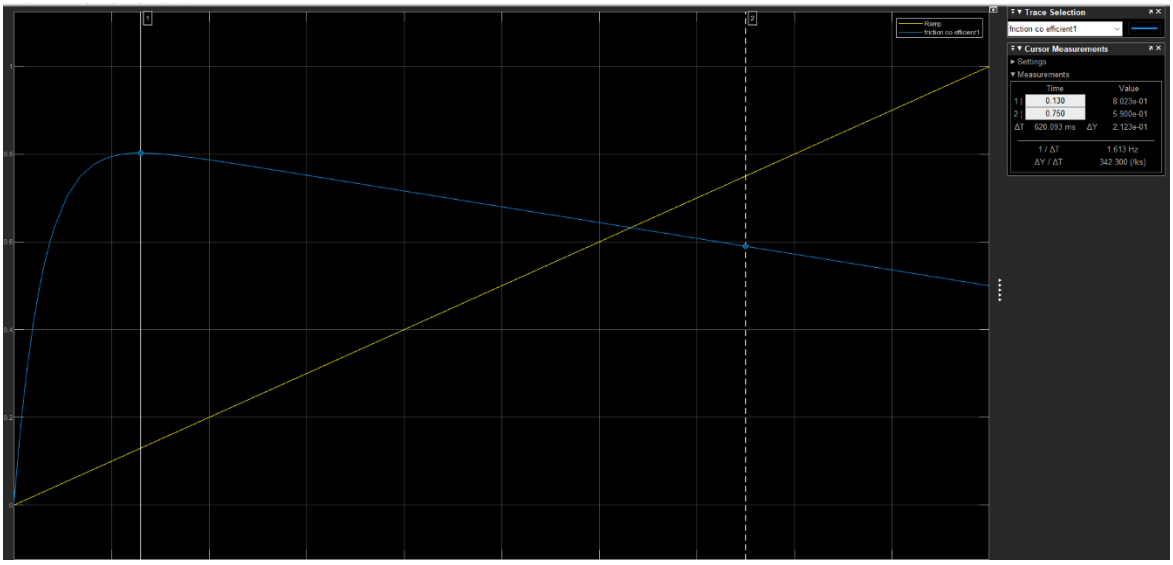

Figure2: Plot Slip vs Friction Co-efficient in the range of 0 to 1

The value of slip that maximizes friction coefficient is found to be 0.13.

Task D&E Model with ABS:

Here I used an initial braking moment of MB = 5500Nm in this simulation but this time with the

correction signal from feedback controller added to it. The initial vehicle velocity is 30m/s.

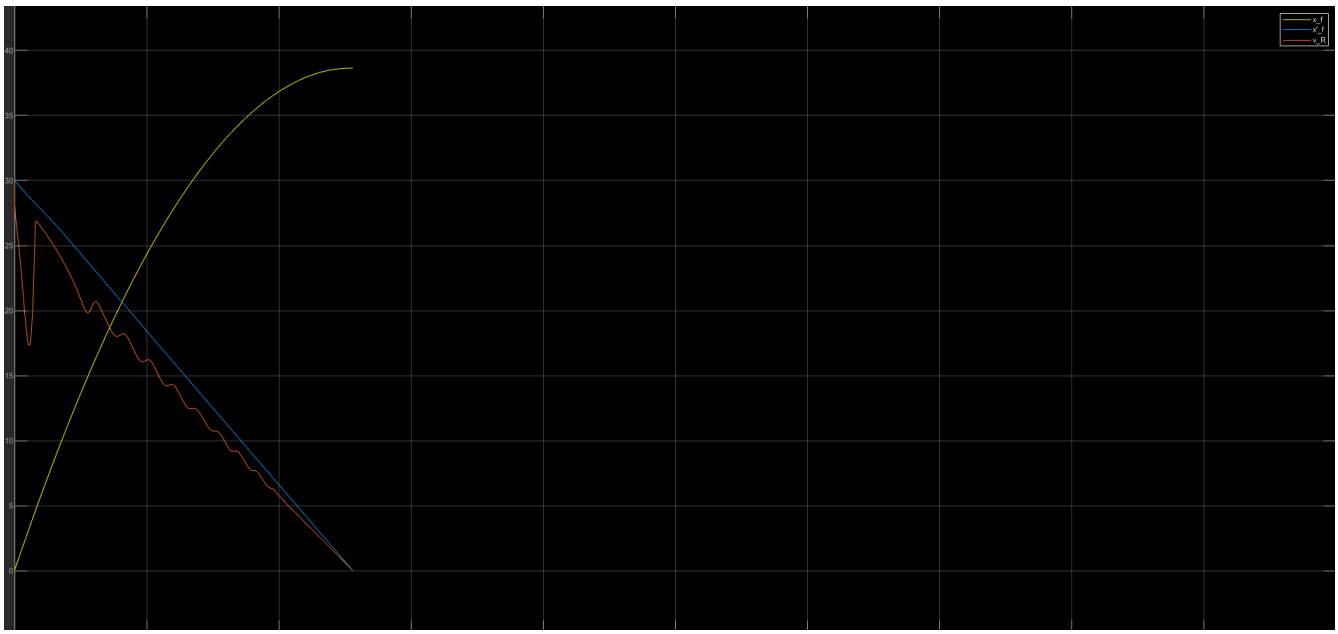

Fig 3:Simulation results with feedback controller to maximize friction coefficient

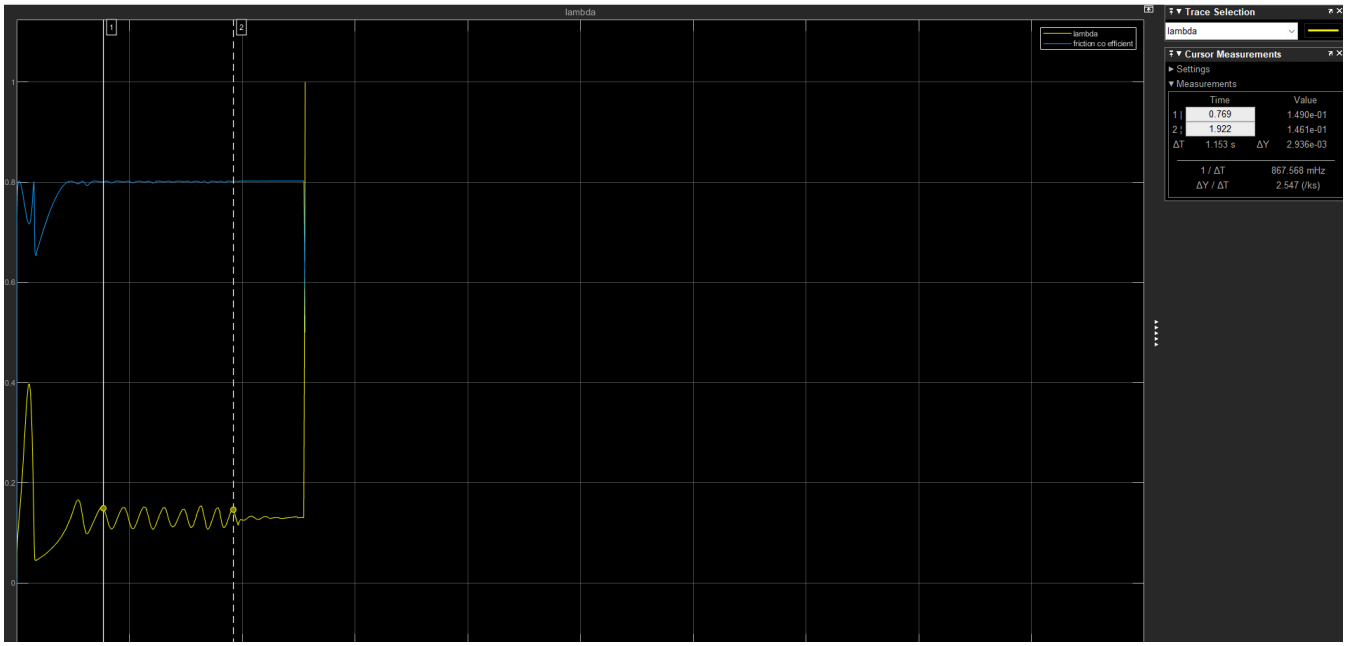

Fig 4: Simulation results -Slip against Friction coefficient for above case

With the constant KI set as 62000 for the controller, the vehicle stops after moving 38.2 metres after

2.532 seconds. There is clearly an improvement in braking here.