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Script for 2011 ME227 HW 1 Problem 2

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(2.1) Linear & Nonlinear tire curves (Lateral force vs. slip angle)

Total lateral force (rear)
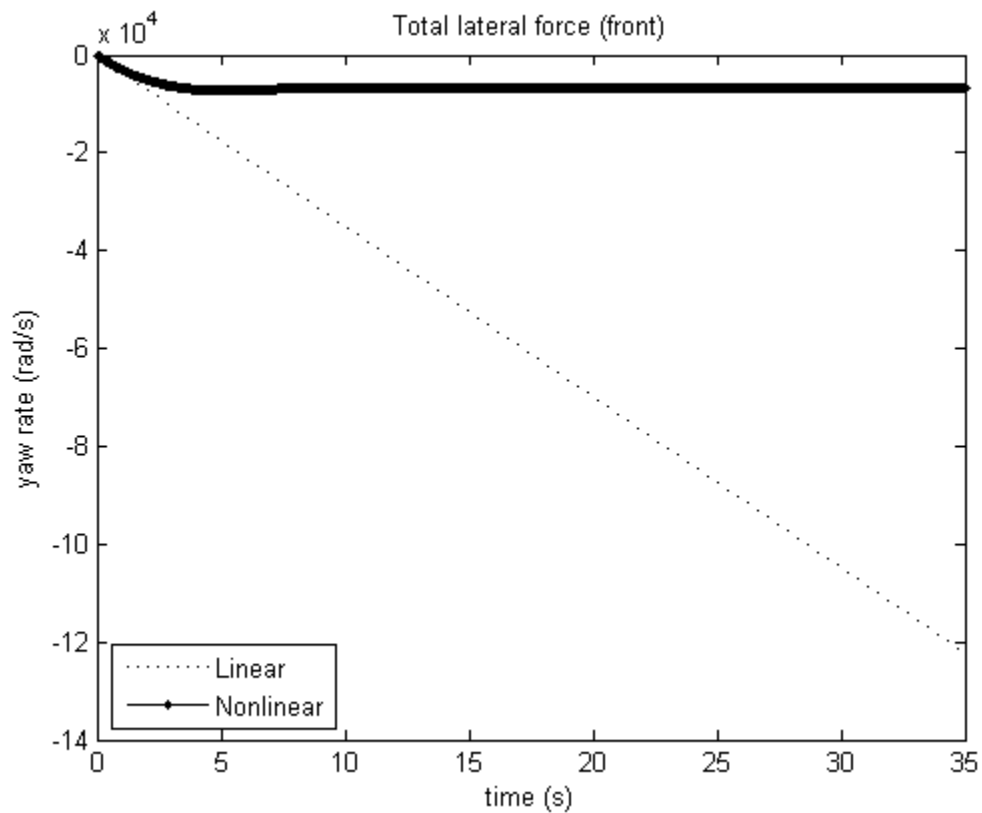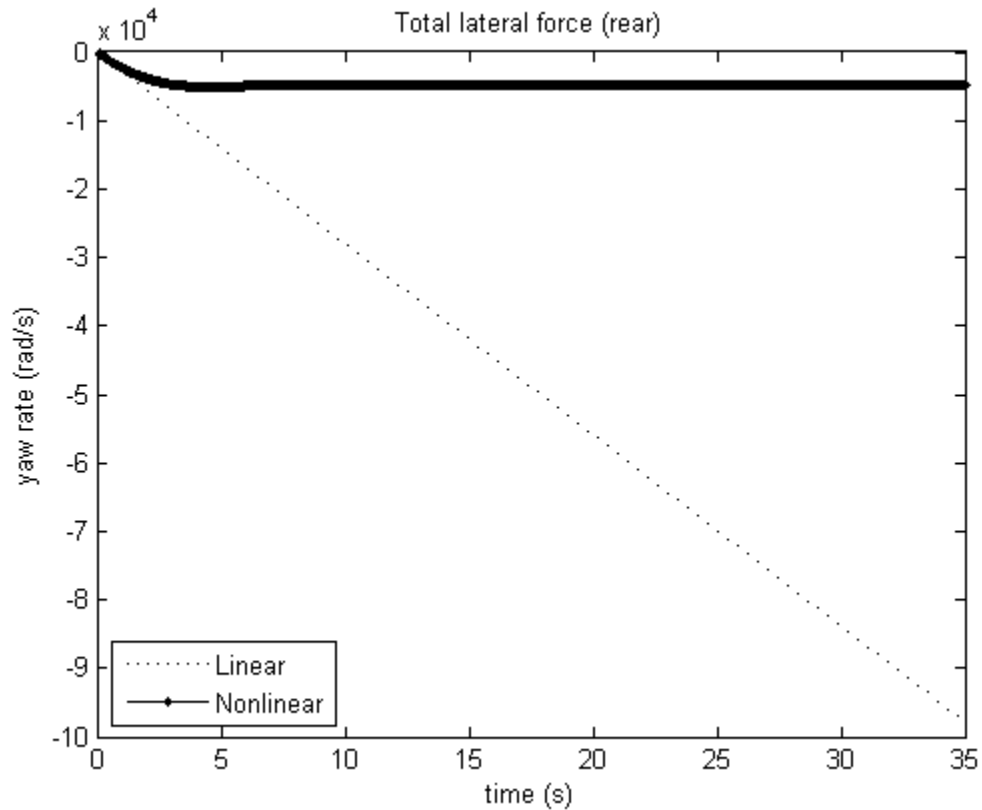
(2.2) Check tire curves

a. The curves look smooth and don't have sudden jumps

b. The initial slopes are fairly close:
Front linear slope (N/deg):
 -30.4617

Front nonlinear slope (N/deg), 0-1 deg:
 -26.2394

Rear linear slope (N/deg):
 -24.3694

Rear nonlinear slope (N/deg), 0-1 deg:
 -20.5459

c. The final force values match exactly:
*Expected final Fyf = -mu_s*b/2L*mg:*
 -3.3817e+003

Actual final Fyf:
 -3.3817e+003

*Expected final Fyr = -mu_s*a/2L*mg:*
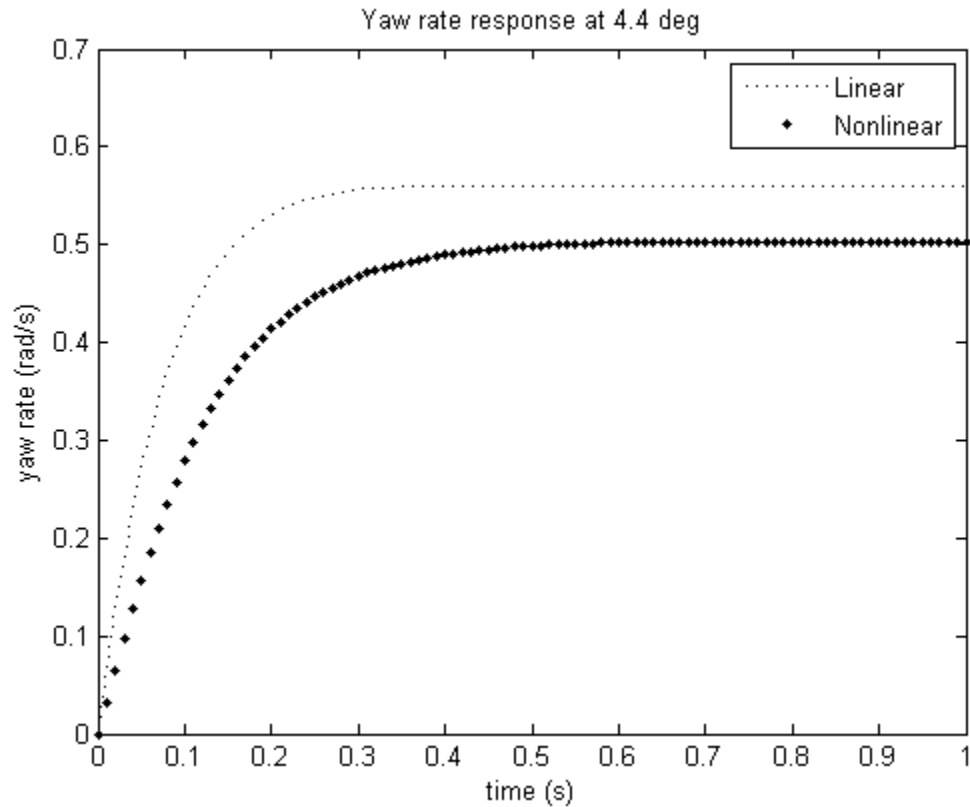 *-2.3744e+003*

Actual final Fyr:
 -2.3744e+003

(2.3) Linear vs. nonlinear yaw rate response

Lateral acceleration (linear) at 4.4 degrees:
*   11.2062*

*derived from a_y = U_y' + r*U_x*

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