

Quarter Car Analysis Using Simulink

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Abstract

This paper presents controller design for controlling various parameters of suspension travel of a quarter car active model. Apart from good ride comfort and handling another equally important suspension's objective is to support the vehicle static weight. The latter objective can be achieved by keeping the suspension travel space within the rattle space limits. For developing the controller the quarter car active suspension model is developed using the Newton's second law of motion with two degrees of freedom. The developed mathematical model of the quarter car is then modelled into MATLAB/Simulink environment. Firstly open loop simulations are carried out and then integral pole placement control strategy is developed for the quarter car model and implemented for the closed loop control simulations. The effectiveness of this controller shows that the suspension travel is well controlled with given suspension travel overshoot within given settling time as compared to the passive quarter car model.