1. Active Vibration Control of Half-Car Suspension System Using PID, Fuzzy and Fuzzy-PID Control System

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ABSTRACT

Active vibration control of half-car suspension system using PID, Fuzzy and Fuzzy-PID control system are studied by using Matlab/Simulink programming package. Different controllers developed and implemented in this study. Each controller was widely simulated for linear half car models for passive suspension system and active suspension system with hydraulically actuator. The study was looking to minimize the deflection and the acceleration of the suspension system in the presence of road disturbances by using active control system. Comparisons between passive and active, linear simulation models have been carried out with different control system. The result of these comparisons was shown the performance of the linear system better when using Fuzzy-PID controller system and as suggested in this work was the best among other controllers. Shows good performance of response amplitude, shorter settling time, small overshot, high steady precision, and good dynamic performance. Mathematical model needs to be implemented and tested to optimize the advantage of suspension system and minimize the disadvantage of the active suspension system. A half car model with hydraulic actuator has been chosen as case study to apply different control designs to obtained best ride comfort of the passengers and road handling.