SIMULATION OF ACTIVE FORCE CONTROL USING MR DAMPER IN SEMI ACTIVE SEAT SUSPENSION SYSTEM

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ABSTRACT

With the rapid development of electronic sensor and actuator industries, semi active seat suspension system has become more and more practical with cheaper price and low power consumption. Magneto-rheological (MR) dampers are among the best and reliable semi active control devices that can produce controllable damping force in a seat suspension system to further improve ride comfort. This paper focus on a new controller scheme named Active Force Control (AFC) to control the damping force of the MR damper to achieve better ride comfort. The phenomenological Bouc-wen model for MR damper had been simulated in Matlab Simulink, to study the effectiveness of the new AFC controller. A sinusoidal signal simulated as vibration sources are subjected to the seat suspension system to investigate the improvement of ride comfort as well as the new AFC controller robustness. Comparison in body acceleration signals from the passive suspension with AFC controller semi active seat suspension system shows improvement to the occupant ride comfort.

Keywords: Active Force Control; Magneto Rheological; Semi Active seat suspension.