Review of: "Simulation of Control System for a Half-Car Suspension System for Passenger Vehicle Application by Designing an LQR Controller"

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Potential competing interests: No potential competing interests to declare.

This paper presents a LQR controller for an active suspension. The research is not novel and lacks practical application. I have the following concerns.

1. Literature review is very poor. There is no comparison with other up-to-date control strategies such robust control or MPC. Please consider these papers:

- “H∞ dynamic output feedback control for a networked control active suspension system under actuator faults”.
- Fault-tolerant H∞ control for active suspension vehicle systems with actuator faults.
- “Tire Slip H∞ Control for Optimal Braking Depending on Road Condition”.
- H∞ control of 8 degrees of freedom vehicle active suspension system.
- “Integral-based event triggering actuator fault-tolerant control for an active suspension system under a networked communication scheme”.
- An LPV control approach for semi-active suspension control with actuator constraints.
- “Simultaneous Estimation of Vehicle Sideslip and Roll Angles Using an Integral-Based Event-Triggered H Observer Considering Intravehicle Communications”.
- “Event-Triggered Fault-Tolerant Control for Vehicle Rollover Avoidance Based on an Active Suspension with Robustness Against Disturbances and Communication Delays”.
- “Event-Triggered Robust Path Tracking Control Considering Roll Stability under Network-Induced Delays for Autonomous Vehicles”.

2. Each novelty should be highlighted in the introduction. I suggest using a bullet list.

3. Use “m” and not “M” when referring to meters in table 1 and through the document.

4. Figure 1 quality is very poor.

5. Equations are illegible and their quality should be improved.

6. There is a formatting error between eq. 4 and eq. 5. There is a figure not referenced there.

7. Figure 2 is irrelevant.

8. In eq. 5, correct u as u(t), since it is not a constant.

9. In section 3, the authors state “In this study, PID and LQR controllers are used”. However, where is the PID reflected?

10. A LQR is considered, which requires full-state knowledge. Is that possible at practice? Which sensors and estimators are to be used for obtaining that information?

11. Present the K gain matrix obtained in a equation.

12. In section 4, simulation results, I miss some figures with the control input.

13. The LQR is an optimal controller, while the vehicle is affected by an external disturbance. Robust control seems more adequate and a comparison with other techniques would be appropriate.