

## Simulation and Optimization of MPV Suspension System Based on ADAMS

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### Abstract

The vehicle suspension system is one of the key parts in vehicles. Its performances can directly influence the steering stability and the ride comfort. The multi-body dynamics model of the MPV (Multi-Purpose Vehicles) front suspension is built by ADAMS/VIEW and the location parameter of front wheel are simulated. In order to improve the kinematics performances and steering stability, the sensitivity analysis and optimization design of the front suspension are completed. It provides the guide and reference for the design and the R&D of the MPV.

Firstly, the multi-body dynamics model of the front suspension is built by ADAMS/VIEW and the location parameter definition and the influence to whole vehicle are simulated and analysed. The simulation and analysis of suspension kinematics performances are completed by the left wheel jump.

Secondly, the nine factors of the suspension guiding mechanism are selected as the design variables and the sensitivity analysis is completed. The influence factors to the toe angle, the camber angle and the wheelbase are found. At last, the optimization design model of guiding mechanism is set up by the sensitivity analysis. The optimal suspension parameters are obtained with optimization design. The suspension performances and the steering stability are improved obviously. The tire wearing is reduced.

### References

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