

STUDY OF A PASSIVE AUTOMOTIVE SUSPENSION

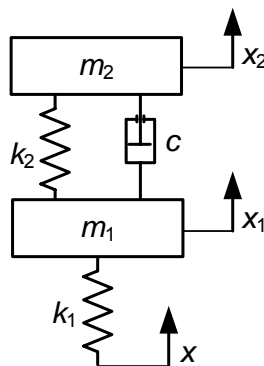
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Key words: automotive suspension, quarter model, modeling

In order to increase the passenger comfort and security, in the paper the dynamic behavior of a non-linear two degrees of freedom vehicle model having passive suspensions is examined. The non-linearity occurs due to viscous friction in the damper. A quarter-car passive automotive suspension model is considered (figure), where x is the road irregularity magnitude, x_1 – vertical car wheel axes displacement, x_2 – vertical car body displacement, m_1 – total wheel element mass, m_2 – quarter part of car body mass, k_1 – equivalent stiffness of the wheel suspension, k_2 – equivalent stiffness of the car body suspension, c – equivalent viscous damping coefficient of the car damping system. For the analytical study, the differential equations describing the car suspension behavior are written. The time responses of the non-linear vehicle model due to road disturbance and the frequency responses of the linearised non-linear vehicle model are obtained. At the end of the study, recommendation concerning the increasing of passenger comfort and security are formulated.



Quarter-car passive automotive suspension model

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