

Usage of the nonlinear method to control model of a half car suspension with a damper containing MR fluid,

STANISŁAW RADKOWSKI¹, MACIEJ SŁOMCZYNSKI^{2*}

1. Warsaw University of Technology, Faculty of Automotive and Construction Machinery Engineering, Poland [0000-0003-2083-0514]
 2. Warsaw University of Technology, Faculty of Automotive and Construction Machinery Engineering, Poland
- * Presenting Author

Abstract: The work focuses on the analysis of the suspension system control based on backstepping control method. The backstepping is type non-linear control method based on error control understood as the displacement of the body from the equilibrium position and stability, according to the Lyapunov method especially the second law of Lyapunow theories. Model presents a half of the car's suspension with nonlinear spring and a damper with magnetorheological fluid, by which modify the damping of the suspension - designed in Matlab - Simulink. The main problem is the consideration of the influence of the front axle of the vehicle on the rear axle and the stabilization of the body displacement along with the rotation angle in relation to the CG. In the context of these issues, backstepping control in the MIMO (Many Inputs Many Outputs) strict feedback form is used. Model was tested in various situations which should good describe effectiveness of this solution.

Keywords: Backstepping, Many inputs many outputs, feedback control, Lyapunov's second method for stability

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