

OPTIMIZATION OF VEHICLES ELASTO-DAMPING CHARACTERISTICS IN THE DRIVER - VEHICLE - ENVIRONMENT DYNAMIC SYSTEM DURING BRAKING

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Stability of a vehicle during the braking process can be improved, besides by optimization of the braking system and tires parameters, also by optimization of characteristics of elasto-damping elements of a vehicle. In this article for optimization we used the driver's model during braking and the model of a middle class vehicle with ten degree of freedom, with linear and nonlinear characteristics of elasto damping elements (springs, shock absorbers, tires, and stabilizer), and modified Hooke - Jeeves method for optimization. The objective function which was used enabled simultaneous minimization of the lateral motion and yaw of the vehicle, and change of normal dynamic reactions of the road on the front and rear wheels of the vehicle during the braking process for a vehicle that moves along a straight line and the drivers influence which is realized through the braking system. The developed method and model of the driver - vehicle - environment system during braking can also be used for optimization of characteristics of the elasto - damping elements of other types of passenger cars.

Key words: *System:Driver - Vehicle - Environment, braking, elasto-damping elements, optimization.*

OPTIMIZACIJA KARAKTERISTIKA ELASTO-PRIGUŠNIH ELEMENATA VOZILA U SISTEMU VOZAČ-VOZILO-OKRUŽENJE U TOKU KOČENJA

Stabilnost motornih vozila u toku procesa kočenja može se poboljšati, pored intervencija na sistemu za kočenje i pneumaticima i opt imizacijom njegovih elasto-prigušnih parametara. U radu je, za optimizaciju, korišćen model vozača u toku procesa kočenja i model vozila srednje klase sa deset stepeni slobode kretanja i linearnim i nelinearnim karakteristikama elasto-prigušnih elemenata (opruga, amortizera, pneumatika i stabilizatora) i modifikovana Hooke-Jeeves-ova metoda. Funkcija cilja je omogućavala istovremenu minimizaciju bočnog odstupanja i vijuganja vozila, kao i promenu dinamičkih reakcija tla pri pravolinijskom kretanju vozila tokom kočenja. Razvijena metoda i model sistema vozač- vozilo-okruženje tokom kočenja mogu biti korišćeni i za optimizaciju karakteristika elasto-prigušnih elemenata drugih tipova putničkih vozila.

Gljučne reči: *Sistem: Vozač-Vozilo-Okruženje, kočenje, elasto-prigušni elementi, optimizacija*